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NRCS Natural Resources Conservation Service

In cooperation with Illinois Agricultural Experiment Station

Soil Survey of Franklin County, Illinois

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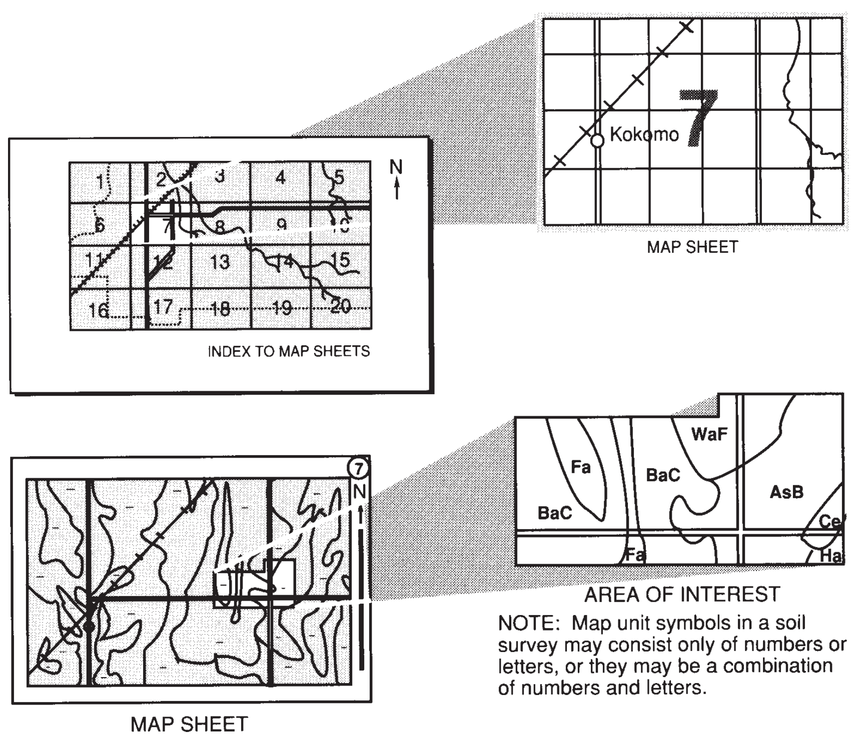
How To Use This Soil Survey

This publication consists of a manuscript and a set of soil maps. The information provided can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets**. Note the number of the map sheet and turn to that sheet.

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.



National Cooperative Soil Survey

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Franklin County Soil and Water Conservation District.

Soil names and descriptions for this update soil survey were approved in 2005. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 2004. The most current information is available through the NRCS Soil Data Mart Web site or the NRCS Web Soil Survey. The Soil Data Mart is the data storage site for the official soil survey information.

Soil maps in this survey may be copied without permission. Original soil survey maps were prepared at publication scale. Viewing scale and printing scale, however, may vary from the original. The bar scale on each map sheet indicates the proper map measurements.

Nondiscrimination Statement

Caption for Cover Photo

A typical landscape and land use pattern in the survey area.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

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Issued 2006

Numerical Index to Map Units

Foreword

This soil survey contains information that can be used in land-planning programs in Franklin County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed to protect the soil resource base. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described, and information on specific uses is given. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

William J. Gradle
State Conservationist
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Soil Survey of
Franklin County, Illinois

By David E. Preloger, Natural Resources Conservation Service

Soils surveyed by Bryan C. Fitch, Natural Resources Conservation Service, and
Rick L. Miller, Franklin County

Survey updated and digitized by Bryan C. Fitch, Dwayne R. Williams, and
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United States Department of Agriculture, Natural Resources Conservation Service,
in cooperation with
the Illinois Agricultural Experiment Station

FRANKLIN COUNTY is in southern Illinois (fig. 1). It has an area of about 276,165 acres, or 431 square miles. It is bounded on the north by Jefferson County, on the east by Hamilton and Saline Counties, on the south by Williamson County, and on the west by Jackson and Perry Counties. In 1990, the population of the county was 40,319. Benton is the county seat.

The survey area is a subset of Major Land Resource Area (MLRA) 113, the Central Claypan Area (USDA, 1981). This survey updates the information for Franklin County published in 2003 (Preloger, 2003).

General Nature of the Survey Area

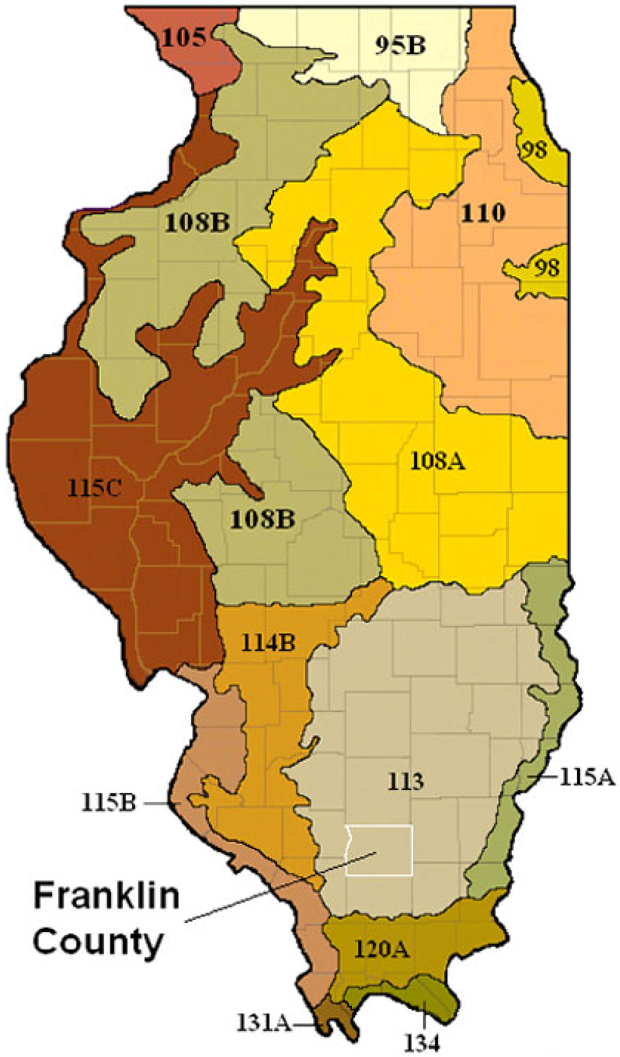
This section provides general information about the survey area. It describes climate; history; natural resources; relief, physiography, and drainage; and transportation facilities and industry.

Climate

Table 1 gives data on temperature and precipitation for the survey area as recorded at Mt. Vernon in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 32 degrees F and the average daily minimum temperature is 22 degrees. The lowest temperature on record is -20 degrees. In summer, the average temperature is 76 degrees and the average daily maximum temperature is 87 degrees. The highest recorded temperature is 104 degrees.

Growing degree days are shown in table 1. They are equivalent to “heat units.” During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.



LEGEND

95B—Southern Wisconsin and Northern Illinois Drift Plain
98—Southern Michigan and Northern Indiana Drift Plain
105—Northern Mississippi Valley Loess Hills
108A and 108B—Illinois and Iowa Deep Loess and Drift
110—Northern Illinois and Indiana Heavy Till Plain
113—Central Claypan Area
114B—Southern Illinois and Indiana Thin Loess and Till Plain
115A, 115B, and 115C—Central Mississippi Valley Wooded Slopes
120A—Kentucky and Indiana Sandstone and Shale Hills and Valleys
131A—Southern Mississippi Valley Alluvium
134—Southern Mississippi Valley Silty Uplands

Figure 1.—Location of Franklin County and major land resource areas (MLRAs) in Illinois.

The total annual precipitation is about 42 inches. Of this total, 23 inches, or about 55 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 12 inches.

Snowfall is rare. In 50 percent of the winters, there is no measurable snowfall. In 20 percent, the snowfall, usually of short duration, is more than 1 inch.

History

Rick L. Miller, soil scientist, Franklin County, helped prepare this section.

In the 1700s and 1800s, the inhabitants of the area that is now Franklin County were the Shawnee Indians, who settled east of the Big Muddy, and the Kaskaskia Indians, who settled west of the Big Muddy. In 1802, a battle between the two tribes all but exterminated the Kaskaskia tribe. Two years later the first white inhabitants, Frenchmen who came to the area from the south, settled near Liberty Church, $2^1/_2$ miles southeast of Thompsonville.

Francis Jordan's Fort was a refuge from Indians in the southern part of the county. It was later called Frank's Fort and, now, Frankfort. The Indians were driven out of the area, and by 1832 none were left in Franklin County.

Three-quarters of the county was forested, and the rest was prairie. The first important crops were Indian corn, tobacco, and pumpkins. Many wildlife species were harvested, including buffalo, deer, and squirrel.

The original county was created in 1818 and named for Benjamin Franklin. It was the 15th county in the State of Illinois. In 1839, Franklin County was divided into Williamson and Franklin Counties and Benton became the county seat. By 1850, Franklin County had 29,003 improved acres and a population of 5,681. In that year, 268,000 bushels of Indian corn was grown. In 1880, more than 1,000,000 bushels of Indian corn was grown.

Natural Resources

Bryan Fitch, soil scientist, Natural Resources Conservation Service, helped prepare this section.

Soil is a valuable natural resource in Franklin County. An estimated 538 farms make up 58 percent of the total acreage in the county.

Soybeans are grown on about 72,000 acres in the county, corn on 44,000 acres, grain sorghum on 4,000 acres, and winter wheat on 12,000 acres. Smaller acreages are used for pasture and hay or fruit crops. In 2000, the total number of livestock farms was 838. The county had 7,100 head of cattle, including dairy cattle. The county also had 20,200 head of hogs. Other livestock includes poultry, sheep and goats, and horses.

About 55,000 acres in the county is forestland. Much of this acreage is unimproved land along the major drainageways, in the steeper areas, or in areas that are close to bedrock. Deer, quail, raccoons, coyote, songbirds, and other wildlife inhabit these areas. Some of the hardwoods are selectively cut by local sawmills.

Several manmade lakes are in the county. The largest, Rend Lake, is 18,900 acres at normal pool and 24,800 acres at flood-control pool. Rend Lake is along the Franklin and Jefferson county line. Franklin County has four other lakes that are 100 acres or larger. These are Lake Benton-Hamilton, which is approximately 100 acres; Lake Moses, about 115 acres; West Frankfort City Lake, 206 acres; and West Frankfort Reservoir, 134 acres.

Much of the survey area is underlain by deposits of oil, natural gas, and coal. Coal resources are estimated at 4.5 billion tons in Franklin County. The coal is at a depth of 500 feet. By 1993, approximately 705,452,664 tons of coal had been mined in the county. In 1992, three mines in Franklin County produced 7,577,848 tons of coal.

Deposits of sand are in scattered small areas of soft sandstone bedrock or occur as pockets in glacial drift. These areas are near the higher elevations in the county. These small sand pits provide material for construction.

Relief, Physiography, and Drainage

Elevation in the survey area ranges from about 350 to 600 feet above sea level.

The soils in the survey area formed in several different kinds of parent material. These include material weathered from Pennsylvanian-age bedrock, Illinoian glacial drift (which includes valley fill sediments), recent alluvium, and Wisconsinan-age water-deposited clayey sediments. Pennsylvanian-age bedrock formations of sandstone, shale, ironstone, and siltstone are dominant in the more rugged areas where glaciers had little influence on the landscape. The ridges in these areas have a Peorian-age loess cap that is 2 to 3 feet thick. The loess is thinner on the steeper side slopes. Roxana Silt, which is an older loess, underlies the Peoria Loess and is 1 to 3 feet thick.

Illinoian glaciation influenced the landscape in the survey area by smoothing the hills and filling the valleys, which resulted in less pronounced relief. Glacial drift covers most of these areas. The thickness of the drift ranges from 2 to 15 feet. In some areas a strongly developed paleosol formed in the upper part of the glacial drift. The loess cap is typically 40 to 60 inches thick overlying the drift. The loess is thinner on the steeper side slopes.

Large areas of Franklin County are dominated by nearly level soils that formed either in recent water-deposited alluvial sediments or in Wisconsinan-age water-deposited clayey sediments. The recent alluvial soils formed in silty material deposited by floodwater from adjacent streams. The Wisconsinan-age material formed in clayey sediment in slackwater glacial lakes. Many of these soils are naturally poorly drained.

Surface drainage generally flows in two directions. Most of the survey area is in the watershed of the Big Muddy River. Two much smaller areas in the eastern part of the survey area drain toward the Ohio River.

The natural drainage pattern in the rolling uplands is well expressed. After heavy rains, the runoff can result in serious erosion of these uplands and cause flooding on the flood plains (fig. 2). The water soon drains away, however, leaving the stream channels dry most of the time.

The less rolling uplands and benches are not as well drained because the degree of slope is not sufficient to allow the surface water to drain away quickly. Permeability in the subsoil is too slow for maximum crop yields. Most of the areas that are subject to ponding have been drained with very shallow surface ditches. Although these soils tend to be poorly drained and somewhat poorly drained, they are among the most productive agronomic soils in the survey area.

Most of the nearly level soils on bottom land are naturally poorly drained and somewhat poorly drained. Most of these soils are used for agronomic purposes. Drainage systems have been installed to remove excess water from these soils. Some crop damage occurs in low-lying areas as a result of flooding, but most of these soils are flooded for less than 2 days at a time.

Transportation Facilities and Industry

Franklin County has a well developed network of transportation routes. Interstate Highway 57 crosses the county from north to south. State Highway 14 crosses Franklin County from east to west. State Highway 14 and Interstate Highway 57 intersect at Benton. Several other State highways and all-weather county roads provide access to the rural areas. A well developed railroad network furnishes freight service.

Several heavy and light industries are located in the county. They are mostly in the Benton area. The heavy industries include tire manufacturing, coal mining, and the rebuilding of locomotives. The light industries include manufacturing of pleasure boats and electrical transformers and rebuilding of underground coal mining equipment and

Figure 2.—Runoff and erosion after heavy rains can create serious sedimentation problems on local roads.

oil well equipment. Also, the survey area has many agricultural and nonagricultural service industries.

How This Survey Was Made

This survey was made to provide information about the soils and miscellaneous areas in the survey area, which is in Major Land Resource Area 113 (fig. 1). Major land resource areas (MLRAs) are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 1981).

The information in this survey includes a description of the soils and miscellaneous areas and their location and a discussion of their suitability, limitations, and management for specified uses. Soil scientists observed the steepness, length, and

shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils and miscellaneous areas in the survey area are in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Formation and Classification of the Soils

This section relates the soils in the survey area to the major factors of soil formation and describes the system of soil classification.

Formation of the Soils

Soil-forming processes act on deposited or accumulated geological material. The characteristics of the soil at any given point are determined by (1) the physical and mineralogical composition of the parent material; (2) the plant and animal life on and in the material that develops into a soil; (3) the topography; (4) the climate under which the soil material has accumulated and existed since accumulation; and (5) the length of time that the processes of soil formation have acted on the soil material.

The factors of soil formation are so closely interrelated that few generalizations can be made regarding the effects of any one factor unless the effects of the other four factors are known. Each factor is modified by the other soil-forming factors.

Climate and plant and animal life are active factors of soil formation. They act on the parent material and slowly change it into a natural body that has genetically related horizons. The effects of climate and plant and animal life are conditioned by relief. Time is needed for the differentiation of soil horizons. Usually, thousands to hundreds of thousands of years are needed for the development of distinct horizons.

Parent Material

Parent material is the geologic or earth material in which a soil forms. It determines the mineral and chemical composition of the soil and to a large extent the rate of the soil-forming processes. The soils in Franklin County formed in loess and silty material; in glacial material, including till and drift; in alluvium and lacustrine sediments; in material that weathered from bedrock; and in a regolith of overburden in areas affected by surface mining and reclamation.

Loess, or wind-deposited material, is the most extensive parent material in the county. It blankets many of the other materials. The uplands in the county generally are blanketed with 3 to 6 feet of loess. The loess was deposited during two periods. Peoria Loess was deposited during the Woodfordian Substage of the Wisconsinan Stage, about 22,000 to 12,500 years ago. Underlying the Peoria Loess is Roxana Silt, which is also a loess. The Roxana Silt was deposited more than 28,000 years ago, during the Altonian Substage. A weakly developed Farmdale Geosol formed in Roxana Silt during the Farmdalian Substage, 28,000 to 22,000 years ago.

The thickness of the Peoria Loess ranges from 20 to 40 inches. Roxana Silt typically ranges from less than 15 inches to 30 inches in thickness. Cisne and Bluford soils are examples of soils that formed in Peoria Loess and in the underlying Roxana Silt over glacial drift.

Glacial drift is a general term applied to all mineral material transported by a glacier and deposited directly by or from the ice or deposited by running water emanating from a glacier. Till is unsorted and unstratified earth material deposited by glacial ice. Till consists of a mixture of clay, silt, sand, gravel, stones, and boulders in any proportion. Ablation till is a general term for less compacted material, either contained

within or accumulated on the surface of a glacier deposited during the downwasting of nearly static glacial ice. In Franklin County the drift and till were deposited mainly during the Illinoian glacial period (125,000 to 300,000 years ago). Older tills are in some areas. Drift ranges from a few feet to more than 20 feet in thickness. The till ranges from about 15 to 30 feet in thickness. It is a mixture of different-sized particles. Drift and till are generally acid in the upper part and calcareous in the lower part. They are firm throughout. The texture is loam, clay loam, or silty clay loam. In many areas the Sangamon Geosol is in the surface layer of the Illinoian till. Soils that formed in till or drift are on side slopes along drainageways. Hickory and Blair soils are examples of soils that formed mainly in this material.

The soils on flood plains formed in alluvium, or water-laid material. They are Wisconsinan in age or younger. Many areas are still receiving sediment. The alluvium ranges from silt loam to clay. Jacob and Cape soils formed dominantly in clayey alluvium in slackwater areas on broad flats and in sloughs. Sharon, Belknap, and Bonnie soils formed in silty alluvium.

In the southern part of the county, lacustrine sediments were deposited on terraces along the Little Muddy River, the Big Muddy River, Middle Fork Creek, and Pond Creek during the latter part of the Wisconsinan Glaciation. The Big Muddy River was blocked, and the resulting slackwater lake backed up water into parts of the flood plains along these creeks. The lacustrine sediments are generally clayey and are blanketed with as much as 2 feet of loess. Okaw, Hurst, and Colp soils formed in loess and in the underlying lacustrine sediments.

Benches are nearly level to gently inclined erosional landscapes. They occur in areas along the Little Muddy River, Rend Lake, Middle Fork Creek, Ewing Creek, and Pond Creek. In these areas are soils that formed in loess over ablation till or Illinoian outwash. Rend soils and some Wynoose and Bluford soils are common in these areas. They occur at elevations of 400 to 450 feet.

On a small acreage in the county, the soils formed at least partly in material that weathered from sandstone, siltstone, shale, or limestone. These soils are in strongly sloping to steep areas. In these areas, soft bedrock is at a depth of 20 to 40 inches and hard bedrock is generally below a depth of 40 inches. Kell soils are common in these areas.

Surface mining for coal has affected a small amount of the acreage in Franklin County. The soils in these areas formed in the material that results from the excavation and placement or replacement of overburden during mining activities. The characteristics of these soils depend mainly on the character of the premined overburden, the method of mining, and the method of reclamation. Spoil banks, or cast overburden material, consist mainly of a mixture of loess, till, and bedrock. Lenzburg soils occur on these spoil banks.

In some areas the loess and till overburden is removed and segregated. The remaining overburden is removed, and the coal is mined. The cast overburden is then replaced. The loess and till overburden is replaced, and the surface is generally covered with material from the surface layer of the premined soils. The loamy, calcareous Schuline soils are examples of the reconstructed soils in these areas.

Plant and Animal Life

Living organisms, such as vegetation, animals, bacteria, and fungi, have important effects on soil formation. Human activities, such as farming and surface mining, also affect soil formation. Vegetation largely determines the content of organic matter and the color and fertility of the surface layer. Most of the soils in Franklin County formed under forest vegetation and have a light-colored surface layer. Examples are Ava and Bluford soils. Some soils formed under a mixture of forest and grass vegetation and

have a moderately dark surface layer. These soils have more organic matter than the soils that formed under trees. Cisne and Hoyleton soils are examples.

Burrowing animals and plant roots help to keep the soil open and porous. Bacteria and fungi help to decompose plant and animal remains.

Topography

Many differences among the soils in the county result from variations in topography. Slope affects drainage, runoff, erosion, and deposition. Slopes differ in gradient, length, shape, and exposure. These slope characteristics are responsible for differences among soils that formed in the same kind of parent material, such as Ava, Bluford, and Wynoose soils. Soils that formed in different kinds of parent material but are in areas of similar topography have similar characteristics. Examples are Bluford and Hurst soils.

As the slope gradient increases, the runoff rate and the hazard of erosion also increase. Erosion can change the characteristics of soils, as is indicated by comparing severely eroded Grantsburg soils with slightly eroded or uneroded Grantsburg soils. In areas of Wynoose soils and other nearly level soils, water has been able to move through the parent material over time. As a result, the subsoil has accumulated more clay and has developed finer textures and the soils are more extensively leached of soluble material. Also, these soils have become more acid because alkaline material, which is soluble, has leached through the subsoil.

Climate

Climate affects plant and animal life, weathering, and erosion. The humid, continental climate in Franklin County has favored the rapid breakdown and weathering of soil material, the formation of clay, and the downward movement of these materials in the profile. Most upland soils in the county have more clay in the subsoil than in the surface layer.

Time

Soils generally become more strongly developed as time passes. Soils that show little or no evidence of profile development are considered immature. Soils that have well expressed horizons are considered mature. The soils in surface-mined areas, such as Lenzburg and Schuline soils, are immature because the active factors of soil formation have had little time (typically less than 50 years) for the differentiation of soil horizons to occur. Belknap soils on flood plains are examples of somewhat immature soils. They still accumulate deposits during periods of flooding and have weakly developed horizons. Bluford and Wynoose soils are examples of mature soils that have well expressed horizons.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (Soil Survey Staff, 1999 and 2003). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 4 shows the classification of the soils in the county. The categories are defined in the following paragraphs.

ORDER. Twelve soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol.* An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Udalfs (*Ud,* meaning humid, plus *alf,* from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Hapludalfs (*Hapl,* meaning minimal horizonation, plus *udalf,* the suborder of the Alfisols that has a udic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective Typic identifies the subgroup that typifies the great group. An example is Typic Hapludalfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, cation-exchange capacity, temperature regime, thickness of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, active, mesic Typic Hapludalfs.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series. The Hickory series is a soil series in this survey area.

Soil Series and Detailed Soil Map Units

In this section, arranged in alphabetical order, each soil series recognized in the survey area is described. Each series description is followed by descriptions of the associated detailed soil map units.

Characteristics of the soil and the material in which it formed are identified for each soil series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the “Soil Survey Manual” (Soil Survey Division Staff, 1993). Many of the technical terms used in the descriptions are defined in “Soil Taxonomy” (Soil Survey Staff, 1999) and in “Keys to Soil Taxonomy” (Soil Survey Staff, 2003). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units on the detailed soil maps in this survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this section, along with the maps, can be used to determine the suitability and potential of a unit for specific uses. They also can be used to plan the management needed for those uses. More information about each map unit is given under the headings “Use and Management of the Soils” and “Soil Properties.”

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of

such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Wynoose silt loam, bench, 0 to 2 percent slopes, is a phase of the Wynoose series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are called complexes. A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Blair-Atlas silty clay loams, 10 to 18 percent slopes, severely eroded, is an example.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. The map unit Dumps, mine, is an example.

Table 5 gives the acreage and proportionate extent of each map unit. Other tables (see Contents) give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils or miscellaneous areas.

Atlas Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landform: Uplands
Position on the landform: Side slopes along drainageways
Parent material: Loess on paleosols that formed in till
Slope range: 10 to 18 percent

Taxonomic classification: Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs

Typical Pedon

Atlas silty clay loam, in an area of Blair-Atlas silty clay loams, 10 to 18 percent slopes, severely eroded; 2,110 feet west and 825 feet north of the southeast corner of sec. 5, T. 3 S., R. 1 E., Jefferson County, Illinois:

Ap—0 to 4 inches; 20 percent yellowish brown (10YR 5/4) and 80 percent dark yellowish brown (10YR 4/4) silty clay loam, very pale brown (10YR 7/4) dry; weak fine granular structure; friable; common very fine and fine roots throughout; few fine rounded soft masses of iron-manganese; strongly acid; clear smooth boundary.

Ap/Btg—4 to 8 inches; 70 percent yellowish brown (10YR 5/4) and 30 percent gray (10YR 5/1) silty clay loam; moderate medium angular blocky structure; firm; common very fine and fine roots between peds; few prominent strong brown (7.5YR 5/6) patchy iron stains on faces of peds and in pores; few fine rounded soft masses of iron-manganese; strongly acid; abrupt smooth boundary.

Btg1—8 to 20 inches; dark gray (10YR 4/1) silty clay; strong fine and medium prismatic structure parting to strong fine and medium angular blocky; very firm; few very fine roots between peds; many faint very dark gray (10YR 3/1) continuous clay films on faces of peds and in pores; few prominent strong brown (7.5YR 5/6) patchy iron stains on faces of peds and in pores; few fine rounded soft masses of iron-manganese; few fine rounded barite crystals; strongly acid; abrupt smooth boundary.

Btg2—20 to 37 inches; light gray (10YR 7/2) clay loam; moderate medium prismatic structure; firm; few very fine roots between peds; common distinct grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; many medium distinct very pale brown (10YR 7/4) masses of iron accumulation in the matrix; few prominent black (7.5YR 2/0) patchy manganese or iron-manganese stains on faces of peds and in pores; few prominent strong brown (7.5YR 5/6) iron stains on faces of peds and in pores; few fine rounded soft masses of iron-manganese; few fine rounded barite crystals; moderately acid; clear smooth boundary.

Btg3—37 to 43 inches; light gray (10YR 7/1) clay loam; moderate medium prismatic structure; firm; few very fine roots between peds; many coarse prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few prominent strong brown (7.5YR 5/6) patchy iron stains in root channels and/or pores; few prominent black (7.5YR 2/0) patchy manganese or iron-manganese stains on faces of peds and in pores; common distinct grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; common fine rounded soft masses of iron-manganese; few fine rounded barite crystals; slightly acid; clear smooth boundary.

Btg4—43 to 60 inches; 50 percent light brownish gray (10YR 6/2) and 50 percent yellowish brown (10YR 5/6) silty clay loam; moderate medium prismatic structure; firm; few very fine roots between peds; common prominent strong brown (7.5YR 5/6) patchy iron stains on faces of peds and in pores; few distinct dark grayish brown (10YR 4/2) patchy clay films in root channels and/or pores; few faint grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; common fine and medium rounded soft masses of iron-manganese; few fine rounded barite crystals; neutral.

Range in Characteristics

Thickness of the loess: 0 to 20 inches
Depth to bedrock: More than 60 inches
Depth to the paleosol: 5 to 30 inches

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam or silt loam

Ap/Btg horizon:
Hue—10YR
Value—4 to 6
Chroma—1 to 3
Texture—silty clay loam or silt loam

Btg horizon:
Hue—10YR, 2.5Y, or N
Value—4 to 7
Chroma—0 to 2
Texture—silty clay, silty clay loam, clay loam, or clay

927D3—Blair-Atlas silty clay loams, 10 to 18 percent slopes, severely eroded

Setting

Landform: Uplands
Position on the landform: Side slopes of drainageways
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Blair—moderately slow; Atlas—very slow
Parent material: Blair—loess and loamy materials on paleosols that formed in till; Atlas—loess on paleosols that formed in drift
Runoff: Rapid
Available water capacity: Blair—high; Atlas—moderate
Seasonal high water table: Blair—1.5 to 3.5 feet below the surface; Atlas—perched at a depth of 1 to 2 feet
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Blair—moderate; Atlas—high
Potential for frost action: High

Typical Profile

Blair
Surface layer:
0 to 5 inches—mixed dark brown and yellowish brown silty clay loam

Subsoil:
5 to 11 inches—mixed yellowish brown and light brownish gray silty clay loam
11 to 18 inches—light brownish gray clay loam
18 to 25 inches—light brownish gray silt loam
25 to 35 inches—light brownish gray silt loam
35 to 53 inches—light brownish gray silty clay loam
53 to 63 inches—light brownish gray loam
63 to 78 inches—yellowish brown silty clay loam
78 to 83 inches—light brownish gray silt loam
83 to 100 inches—yellowish brown loam

Atlas
Surface layer:
0 to 4 inches—mixed dark yellowish brown and yellowish brown silty clay loam
4 to 8 inches—mixed yellowish brown and gray silty clay loam

Subsoil:
8 to 20 inches—dark gray silty clay
20 to 43 inches—light gray clay loam
43 to 60 inches—mixed light brownish gray and yellowish brown silty clay loam

Composition

Blair and Atlas soils and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Somewhat poorly drained soils that contain more loess in the profile
- Soils that are less sloping

Contrasting inclusions:
- The moderately well drained Plumfield soils, which are more brittle than the major soils
- The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

Use and Management

Cropland
Management measures or considerations:
- Because of the slope and the hazard of erosion, these soils are unsuited to use as cropland.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The Blair soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- These soils are suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: The shrink-swell potential, wetness, and the slope
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.
- Building on the contour or land shaping helps to overcome the slope.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 6e

Ava Series

Depth class: Moderately deep to a fragipan and very deep to bedrock
Drainage class: Moderately well drained
Permeability: Very slow
Landform: Uplands
Position on the landform: Ridgetops and side slopes of interfluves
Parent material: Loess and glacial drift
Slope range: 2 to 10 percent

Taxonomic classification: Fine-silty, mixed, active, mesic Oxyaquic Fragiudalfs

Typical Pedon

Ava silt loam, 2 to 5 percent slopes, 740 feet west and 2,400 feet north of the southeast corner of sec. 34, T. 4 S., R. 1 E., Jefferson County, Illinois:

Ap—0 to 5 inches; brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; weak fine granular structure; friable; common very fine and fine roots throughout; neutral; abrupt smooth boundary.

E—5 to 13 inches; yellowish brown (10YR 5/6) silt loam; moderate medium platy structure; firm; few very fine roots throughout; few fine rounded soft masses of iron-manganese; very strongly acid; abrupt smooth boundary.

BE—13 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; firm; few very fine roots between peds; many distinct light gray (10YR 7/1) continuous skeletans (silt) on faces of peds; few fine rounded soft masses of iron-manganese; very strongly acid; abrupt smooth boundary.

Bt1—15 to 26 inches; dark yellowish brown (10YR 4/4) silty clay loam; few fine faint brown (10YR 5/3) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; few very fine roots between peds; many faint brown (7.5YR 4/4) continuous clay films on faces of peds and few distinct light gray (10YR 7/1) patchy skeletans (silt); few fine rounded soft masses of iron-manganese; extremely acid; clear smooth boundary.

Bt2—26 to 33 inches; 70 percent yellowish brown (10YR 5/6) and 30 percent brown (10YR 5/3) silty clay loam; moderate medium prismatic structure; very firm; few very fine roots between peds; very few distinct light gray (10YR 7/1) patchy skeletans (silt) on faces of peds and few faint dark yellowish brown (10YR 4/4) discontinuous clay films; few fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few fine rounded soft masses of iron-manganese; extremely acid; clear smooth boundary.

2Btx1—33 to 54 inches; 60 percent yellowish brown (10YR 5/6) and 40 percent brown (10YR 5/3) silty clay loam; weak coarse prismatic structure parting to weak medium platy; very firm, brittle; very few distinct light gray (10YR 7/1) patchy skeletans (silt) on faces of peds and few faint brown (10YR 4/3) discontinuous clay films; common fine distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common fine rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

2Btx2—54 to 62 inches; 60 percent yellowish brown (10YR 5/4) and 40 percent grayish brown (10YR 5/2) silt loam; common fine and medium distinct pale brown (10YR 6/3) mottles; weak coarse prismatic structure parting to weak medium platy; very firm, brittle; very few faint brown (10YR 4/3) discontinuous clay films on

faces of peds; common fine rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

3Btx3—62 to 80 inches; yellowish brown (10YR 5/6) loam; common fine and medium distinct pale brown (10YR 6/3) mottles; weak coarse prismatic structure; very firm, brittle; very few distinct brown (10YR 4/3) discontinuous clay films on faces of peds and in pores; common fine rounded soft masses of iron-manganese; slightly acid; 1 percent igneous pebbles.

Range in Characteristics

Thickness of the loess: 20 to 35 inches
Depth to bedrock: More than 60 inches
Carbonates: None
Depth to the fragipan: 25 to 40 inches

A or Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silty clay loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

B/E horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 to 8
Chroma—1 to 6
Texture—silty clay loam or silt loam

B´t horizon (if it occurs):
Hue—10YR or 7.5YR
Value—3 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Btx horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam, silty clay loam, loam, or clay loam

14B—Ava silt loam, 2 to 5 percent slopes

Setting

Landform: Uplands
Position on the landform: Convex ridgetops on interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Loess and glacial drift
Runoff: Medium
Available water capacity: High
Seasonal high water table: Perched at a depth of 1.5 to 3.5 feet
Organic matter content: Low or moderately low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 5 inches—brown silt loam

Subsurface layer:
5 to 13 inches—yellowish brown silt loam

Subsoil:
13 to 15 inches—yellowish brown silty clay loam
15 to 26 inches—dark yellowish brown silty clay loam
26 to 33 inches—mixed yellowish brown and brown silty clay loam
33 to 54 inches—mixed yellowish brown and brown, brittle silty clay loam
54 to 62 inches—mixed yellowish brown and grayish brown, brittle silt loam
62 to 80 inches—yellowish brown, brittle loam

Composition

Ava soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that are redder and less brittle than the Ava soil
- Soils that are more severely eroded than the Ava soil
- Soils that are more sloping than the Ava soil
- Soils that formed in bedrock residuum

Contrasting inclusions:
- The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

14B2—Ava silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Uplands
Position on the landform: Side slopes of interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Loess over glacial drift

Runoff: Medium
Available water capacity: Moderate or high
Seasonal high water table: Perched at a depth of 1.5 to 3.5 feet
Organic matter content: Low or moderately low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown silt loam
6 to 9 inches—mixed brown and yellowish brown silt loam

Subsoil:
9 to 17 inches—yellowish brown silty clay loam
17 to 21 inches—yellowish brown silty clay loam and white silt
21 to 28 inches—brown silty clay loam
28 to 36 inches—dark yellowish brown, brittle silt loam
36 to 48 inches—yellowish brown, brittle silt loam
48 to 64 inches—yellowish brown, brittle loam
64 to 78 inches—yellowish brown clay loam

Composition

Ava soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that are redder and less brittle than the Ava soil
- Soils that are less severely eroded than the Ava soil
- Soils that are more sloping than the Ava soil
- Soils that formed in bedrock residuum

Contrasting inclusions:
- The somewhat poorly drained Blair soils at the head of drainageways and on concave side slopes

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

14C2—Ava silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Uplands
Position on the landform: Side slopes of interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Loess over glacial drift
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: Perched at a depth of 1.5 to 3.5 feet
Organic matter content: Low or moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown silt loam

Subsoil:
5 to 8 inches—mixed yellowish brown and brown silty clay loam
8 to 10 inches—yellowish brown silty clay loam and white silt
10 to 17 inches—mixed dark yellowish brown and yellowish brown silty clay loam
17 to 23 inches—mixed brown and dark yellowish brown, brittle silty clay loam
23 to 32 inches—dark yellowish brown, brittle silt loam
32 to 57 inches—yellowish brown, brittle silt loam
57 to 78 inches—yellowish brown silty clay loam

Composition

Ava soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that are brittle at a depth of less than 17 inches
- Soils that are more severely eroded than the Ava soil
- Soils that are less sloping than the Ava soil
- Soils that formed in bedrock residuum

Contrasting inclusions:
- The somewhat poorly drained Blair and Atlas soils at the head of drainageways and on concave side slopes

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:

- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: Wetness and the shrink-swell potential

Management measures or considerations:

- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability

Management measures or considerations:

- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3e

Belknap Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Flood plains
Position on the landform: Toeslopes
Parent material: Silty alluvium
Slope range: 0 to 2 percent

Taxonomic classification: Coarse-silty, mixed, active, acid, mesic Fluvaquentic Endoaquepts

Typical Pedon

Belknap silt loam, frequently flooded, 1,000 feet east and 1,000 feet north of the center of sec. 33, T. 2 N., R. 12 W., Wabash County, Illinois:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; friable; strongly acid; abrupt smooth boundary.

A—7 to 13 inches; dark grayish brown (10YR 4/2) silt loam; weak thin platy structure parting to weak fine granular; friable; slightly compact as a plowpan; few medium faint brown (10YR 5/3) and few fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; strongly acid; gradual smooth boundary.

Bg—13 to 27 inches; dark grayish brown (10YR 4/2), grayish brown (10YR 5/2), and brown (10YR 5/3) silt loam; weak medium granular structure with a tendency toward subangular blocky; friable; few medium faint light brownish gray (10YR 6/2)

iron depletions and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few iron and manganese concretions; strongly acid; gradual smooth boundary.

Cg1—27 to 59 inches; light brownish gray (10YR 6/2) silt loam; massive; friable; common fine prominent dark reddish brown (2.5YR 3/4) and yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; many iron and manganese concretions increasing in number and size with increasing depth; strongly acid; gradual smooth boundary.

Cg2—59 to 65 inches; dark gray (10YR 4/1) silt loam; massive; friable; common medium faint gray (10YR 6/1) iron depletions and few medium prominent brown (7.5YR 5/4) masses of iron accumulation in the matrix; many iron and manganese concretions; moderately acid.

Range in Characteristics

Depth to bedrock: More than 60 inches

Ap or A horizon:
Hue—10YR
Value—4 to 6
Chroma—2 or 3
Texture—silt loam

Bg or Bw horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silt loam

Cg or C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silt loam; strata of silty clay loam below a depth of 40 inches in some pedons

3382A—Belknap silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Toeslopes
Flooding frequency: Frequent
Flooding duration: Brief
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high or high
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: None or slight

Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—brown silt loam

Substratum:
9 to 19 inches—mixed yellowish brown and grayish brown silt loam
19 to 60 inches—light brownish gray silt loam

Composition

Belknap soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Belknap soil
- Soils that have a seasonal high water table at a depth of more than 3 feet; in the higher areas
- Soils that have a seasonal high water table at a depth of less than 1 foot; in the lower areas

Contrasting inclusions:
- The very poorly drained Bonnie and Cape soils in undrained, shallow closed depressions
- Areas that are less than 60 inches deep over Pennsylvanian-age shale bedrock

Use and Management

Cropland
Management concerns: Wetness, flooding, and tilth
Management measures or considerations:
- A well maintained surface drainage system reduces the wetness and helps to protect the soil from flooding during the growing season.
- Tilling when the soil is wet causes surface cloddiness and compaction, increases runoff and erosion, and reduces the rate of water infiltration.
- Returning crop residue to the soil and regularly adding other organic material help to minimize surface crusting and maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness, flooding, and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.

- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management measures or considerations:
- Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

Septic tank absorption fields
Management measures or considerations:
- Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 3w

Blair Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Uplands
Position on the landform: Head slopes and side slopes along drainageways
Parent material: Loess over glacial drift
Slope range: 5 to 18 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aquic Hapludalfs

Typical Pedon

Blair silty clay loam, 5 to 10 percent slopes, severely eroded, 2,240 feet west and 140 feet south of the northeast corner of sec. 14, T. 6 S., R. 1 E., Franklin County, Illinois:

Ap—0 to 6 inches; yellowish brown (10YR 5/4) silty clay loam; weak fine granular structure; friable; common very fine and fine roots throughout; common fine rounded iron-manganese concretions; strongly acid; clear smooth boundary.

Bt1—6 to 15 inches; yellowish brown (10YR 5/4) silty clay loam; weak medium prismatic structure parting to weak medium platy; firm; few very fine and fine roots between peds; common distinct dark grayish brown (10YR 4/2) continuous clay films (cutans) on faces of peds and in pores and few prominent strong brown (7.5YR 5/6) discontinuous iron stains; many fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

Bt2—15 to 27 inches; yellowish brown (10YR 5/4) silt loam; weak medium prismatic structure; firm; few very fine roots between peds; few distinct light brownish gray (10YR 6/2) discontinuous clay films (cutans) on faces of peds and in pores and common prominent strong brown (7.5YR 5/6) iron stains; many fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common fine rounded iron-manganese concretions and common fine and medium irregular soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

Btg—27 to 42 inches; gray (10YR 5/1) silt loam; weak thick platy structure; firm; few very fine roots between peds; few distinct brown (10YR 5/3) discontinuous clay films (cutans) on faces of peds and in pores, few prominent strong brown (7.5YR 5/8) patchy iron stains in root channels and/or pores, and few black (2.5Y 2/0)

manganese or iron-manganese stains; many fine and medium prominent yellowish brown (10YR 5/4 and 5/6) masses of iron accumulation in the matrix; common fine rounded iron-manganese concretions; very strongly acid; gradual smooth boundary.

BCg1—42 to 50 inches; gray (10YR 5/1 and 6/1) silt loam; weak medium prismatic structure parting to weak fine subangular blocky; firm; common fine prominent yellowish brown (10YR 5/4 and 5/6) and common medium distinct dark yellowish brown (10YR 4/4) masses of iron accumulation in the matrix; few prominent black (2.5Y 2/0) patchy manganese or iron-manganese stains in root channels and/or pores and few strong brown (7.5YR 5/8) iron stains; common fine rounded iron-manganese concretions; strongly acid; clear smooth boundary.

BCg2—50 to 62 inches; light brownish gray (10YR 6/2) loam; weak coarse prismatic structure; firm; common fine and medium prominent yellowish brown (10YR 5/4 and 5/6) masses of iron accumulation in the matrix; few prominent strong brown (7.5YR 5/8) patchy iron stains in root channels and/or pores; common fine rounded iron-manganese concretions; strongly acid.

Range in Characteristics

Thickness of the loess: Less than 20 inches
Depth to bedrock: More than 60 inches
Depth to carbonates: More than 60 inches

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam, loam, silty clay loam, or clay loam

Bt horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam, silt loam, clay loam, or loam

Btg or BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or loam

5C3—Blair silty clay loam, 5 to 10 percent slopes, severely eroded

Setting

Landform: Uplands
Position on the landform: Head slopes along drainageways
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Loess and loamy materials on paleosols that formed in till
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface

Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—yellowish brown silty clay loam

Subsoil:
6 to 15 inches—yellowish brown silty clay loam
15 to 27 inches—yellowish brown silt loam
27 to 42 inches—gray silt loam
42 to 50 inches—mixed gray and light gray silt loam
50 to 62 inches—light brownish gray loam

Composition

Blair soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have thicker loess
- Soils that have a claypan
- Soils that are less sloping than the Blair soil

Contrasting inclusions:
- The moderately well drained Ava, Plumfield, and Zanesville soils, which are more brittle than the Blair soil
- Belknap soils, which are subject to frequent flooding; on narrow flood plains between side slopes of drainageways

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:

- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: Wetness and the shrink-swell potential

Management measures or considerations:

- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability

Management measures or considerations:

- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 4e

927D3—Blair-Atlas silty clay loams, 10 to 18 percent slopes, severely eroded

Setting

Landform: Uplands
Position on the landform: Side slopes of drainageways
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Blair—moderately slow; Atlas—very slow
Parent material: Blair—loess and loamy materials on paleosols that formed in till; Atlas—loess on paleosols that formed in drift
Runoff: Rapid
Available water capacity: Blair—high; Atlas—moderate
Seasonal high water table: Blair—1.5 to 3.5 feet below the surface; Atlas—perched at a depth of 1 to 2 feet
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Blair—moderate; Atlas—high
Potential for frost action: High

Typical Profile

Blair

Surface layer:

0 to 5 inches—mixed dark brown and yellowish brown silty clay loam

Subsoil:
5 to 11 inches—mixed yellowish brown and light brownish gray silty clay loam
11 to 18 inches—light brownish gray clay loam
18 to 25 inches—light brownish gray silt loam
25 to 35 inches—light brownish gray silt loam
35 to 53 inches—light brownish gray silty clay loam
53 to 63 inches—light brownish gray loam
63 to 78 inches—yellowish brown silty clay loam
78 to 83 inches—light brownish gray silt loam
83 to 100 inches—yellowish brown loam

Atlas
Surface layer:
0 to 4 inches—mixed dark yellowish brown and yellowish brown silty clay loam
4 to 8 inches—mixed yellowish brown and gray silty clay loam

Subsoil:
8 to 20 inches—dark gray silty clay
20 to 43 inches—light gray clay loam
43 to 60 inches—mixed light brownish gray and yellowish brown silty clay loam

Composition

Blair and Atlas soils and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Somewhat poorly drained soils that contain more loess in the profile
- Soils that are less sloping

Contrasting inclusions:
- The moderately well drained Plumfield soils, which are more brittle than the major soils
- The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

Use and Management

Cropland
Management measures or considerations:
- Because of the slope and the hazard of erosion, these soils are unsuited to use as cropland.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The Blair soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:

- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- These soils are suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: The shrink-swell potential, wetness, and the slope

Management measures or considerations:

- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.
- Building on the contour or land shaping helps to overcome the slope.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability

Management measures or considerations:

- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 6e

Bluford Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Uplands and benches
Position on the landform: Broad flats on divides and side slopes along drainageways
Parent material: Loess over glacial drift
Slope range: 0 to 5 percent

Taxonomic classification: Fine, smectitic, mesic Aeric Fragic Epiaqualfs

Typical Pedon

Bluford silt loam, 0 to 2 percent slopes, 2,540 feet north and 140 feet west of the southeast corner of sec. 34, T. 4 S., R. 1 E., Jefferson County, Illinois:

Ap—0 to 5 inches; grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; common fine roots throughout; common fine rounded iron-manganese concretions; neutral; clear smooth boundary.

E—5 to 12 inches; brown (10YR 5/3) silt loam; weak medium platy structure; friable; few fine roots throughout; many fine faint yellowish brown (10YR 5/4) masses of iron accumulation and common grayish brown (10YR 5/2) iron depletions in the matrix; common fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

BE—12 to 15 inches; light yellowish brown (10YR 6/4) silt loam; weak fine and medium subangular blocky structure; friable; few fine roots throughout; many distinct light gray (10YR 7/2) continuous skeletans (silt) throughout; common fine distinct

yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine rounded iron-manganese concretions; very strongly acid; abrupt smooth boundary.

Bt—15 to 26 inches; brown (10YR 5/3) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; very firm; few fine roots between peds; common faint grayish brown (10YR 5/2) continuous clay films and few distinct light gray (10YR 7/2) discontinuous skeletans (silt) on faces of peds and in pores; many fine faint grayish brown (10YR 5/2) iron depletions and common fine and medium faint yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; few fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

Btg—26 to 40 inches; grayish brown (10YR 5/2) silty clay loam; weak medium prismatic structure; firm; few fine roots between peds; few faint brown (10YR 5/3) discontinuous clay films and few faint gray (10YR 5/1) clay films on faces of peds and in pores; very few distinct light gray (10YR 7/2) skeletans (silt); many fine and medium distinct yellowish brown (10YR 5/4) and common faint brown (10YR 5/3) masses of iron accumulation in the matrix; very strongly acid; gradual smooth boundary.

2Bx—40 to 64 inches; grayish brown (10YR 5/2) and yellowish brown (10YR 5/4) silt loam; moderate thin and medium platy structure; firm, brittle; few fine roots between peds; many medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine rounded iron-manganese concretions; very strongly acid; gradual smooth boundary.

3BC—64 to 76 inches; yellowish brown (10YR 5/6) loam; weak coarse prismatic structure; firm; common medium prominent grayish brown (10YR 5/2) iron depletions in the matrix; common fine rounded iron-manganese concretions and common medium irregular soft masses of iron-manganese; very strongly acid.

Range in Characteristics

Thickness of the loess: 30 to 45 inches
Depth to bedrock: More than 60 inches
Depth to carbonates: More than 60 inches
Depth to fragic soil properties: 22 to 54 inches

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

E or BE horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam

Bt or Btg horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam or silty clay

2Bx or 2Btx horizon:
Hue—10YR or 7.5YR
Value—4 to 6

Chroma—2 to 8
Texture—silt loam, loam, silty clay loam, or clay loam

13A—Bluford silt loam, 0 to 2 percent slopes

Setting

Landform: Uplands
Position on the landform: Broad convex flats on divides or interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess over glacial drift
Runoff: Slow
Available water capacity: High
Seasonal high water table: Perched at a depth of 1 to 3 feet
Organic matter content: Moderately low or moderate
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 5 inches—grayish brown silt loam

Subsurface layer:
5 to 12 inches—brown silt loam

Subsoil:
12 to 15 inches—light yellowish brown silt loam
15 to 26 inches—brown silty clay loam
26 to 40 inches—grayish brown silty clay loam
40 to 64 inches—mixed grayish brown and yellowish brown, brittle silt loam
64 to 76 inches—yellowish brown loam

Composition

Bluford soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Bluford soil
- Soils that are more sloping than the Bluford soil
- Soils that have a seasonal high water table within a depth of 1 foot
- Soils that are deeper to a claypan than the Bluford soil

Contrasting inclusions:
- The moderately well drained Ava soils on side slopes and nose slopes of interfluves

Use and Management

Cropland
Management concerns: Wetness and tilth

Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness
Management measures or considerations:
- Onsite investigation is needed.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2w

13B2—Bluford silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Uplands
Position on the landform: Side slopes along drainageways
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow

Parent material: Loess over glacial drift
Runoff: Medium
Available water capacity: High
Seasonal high water table: Perched at a depth of 1 to 3 feet
Organic matter content: Moderately low or moderate
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown silt loam

Subsoil:
7 to 11 inches—pale brown silty clay loam
11 to 44 inches—mixed yellowish brown and light brownish gray silty clay loam
44 to 62 inches—grayish brown, brittle silt loam
62 to 78 inches—mixed grayish brown and yellowish brown silt loam

Composition

Bluford soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Bluford soil
- Soils that are less sloping than the Bluford soil
- Soils that have a seasonal high water table within a depth of 1 foot

Contrasting inclusions:
- The moderately well drained Ava soils on nose slopes and side slopes
- The somewhat poorly drained Belknap soils, which are subject to frequent flooding; in narrow, long areas of bottom land in drainageways
- The poorly drained Racoon soils in shallow closed depressions

Use and Management

Cropland
Management concerns: Erosion, wetness, and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion, wetness, and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland

Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: Wetness
Management measures or considerations:
- Onsite investigation is needed.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

640A—Bluford silt loam, bench, 0 to 2 percent slopes

Setting

Landform: Benches
Position on the landform: Broad, convex interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess over glacial drift (outwash, ablation till)
Runoff: Slow
Available water capacity: High
Seasonal high water table: Perched at a depth of 1 to 3 feet
Organic matter content: Moderately low or moderate
Erosion hazard: None or slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—dark grayish brown silt loam

Subsurface layer:
10 to 17 inches—brown silt loam

Subsoil:
17 to 30 inches—brown silty clay loam
30 to 41 inches—brown and yellowish brown silty clay
41 to 52 inches—brown silty clay loam
52 to 60 inches—light brownish gray silt loam

Composition

Bluford soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Bluford soil
- Soils that have a thicker surface layer and subsurface layer than those of the Bluford soil
- Soils that are more sloping than the Bluford soil
- Soils that have a seasonal high water table at a depth of less than 2 feet

Contrasting inclusions:
- The moderately well drained Rend soils on nose slopes and side slopes
- The somewhat poorly drained Hurst soils in adjacent areas

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: Wetness and the shrink-swell potential

Management measures or considerations:

- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability

Management measures or considerations:

- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2w

Bonnie Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Moderately slow
Landform: Flood plains
Position on the landform: Toeslopes
Parent material: Silty alluvium
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, active, acid, mesic Typic Fluvaquents

Typical Pedon

Bonnie silt loam, 0 to 2 percent slopes, frequently flooded, 2,660 feet north and 1,920 feet east of the southwest corner of sec. 21, T. 5 S., R. 4 E., Franklin County, Illinois:

Ap1—0 to 5 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; common fine and medium roots throughout; common fine rounded soft masses of iron-manganese; slightly acid; abrupt smooth boundary.

Ap2—5 to 10 inches; light brownish gray (10YR 6/2) and dark grayish brown (10YR 4/2) silt loam; weak medium angular blocky structure parting to weak medium platy; friable; common fine and medium roots throughout; common fine and medium faint brown (10YR 4/3) masses of iron accumulation in the matrix; common fine rounded soft masses of iron-manganese; moderately acid; abrupt smooth boundary.

Cg1—10 to 27 inches; gray (10YR 6/1) and light gray (10YR 7/1) silt loam; massive; friable; few very fine roots throughout; common fine and medium prominent yellowish brown (10YR 5/4 and 5/6) and common medium faint grayish brown (10YR 5/2) masses of iron accumulation in the matrix; common fine rounded soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Cg2—27 to 60 inches; gray (10YR 6/1) silt loam; massive; friable; common fine and medium prominent yellowish brown (10YR 5/4 and 5/6) masses of iron accumulation in the matrix; common fine rounded soft masses of iron-manganese; very strongly acid.

Range in Characteristics

Depth to bedrock: More than 60 inches

A or Ap horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 3
Texture—silt loam

Cg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—5 to 7
Chroma—0 to 2
Texture—silt loam

1108A—Bonnie silt loam, undrained, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Toeslopes
Flooding frequency: Frequent
Flooding duration: Long
Major uses: Wildlife habitat and woodland

Soil Properties and Qualities

Drainage class: Very poorly drained
Permeability: Moderately slow
Parent material: Silty alluvium
Runoff: Ponded
Available water capacity: Very high
Seasonal high water table: 2.0 feet above to 0.5 foot below the surface
Organic matter content: Moderately low
Erosion hazard: None
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—mixed dark grayish brown and grayish brown silt loam

Substratum:
6 to 9 inches—mixed grayish brown and gray silt loam
9 to 20 inches—gray silt loam
20 to 28 inches—light brownish gray silt loam
28 to 60 inches—light gray silt loam

Composition

Bonnie soil: 100 percent

Use and Management

Cropland
Management measures or considerations:
- Because of the flooding and ponding, this soil is unsuited to use as cropland.

Pasture and hay

Management measures or considerations:

- Because of the ponding, this soil is unsuited to use for pasture and hay.

Forestland

Management measures or considerations:

- Because of the ponding, this soil is poorly suited to use as forestland (fig. 3).

Wildlife habitat

Management measures or considerations:

- Areas of this soil provide habitat and a water supply for wildlife. Shallow water areas generally are available or can be developed easily.
- During periods when it is flooded, this soil furnishes temporary feeding and nesting sites for waterfowl.
- The habitat should be protected from fire and from livestock grazing.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings

Management measures or considerations:

- Because of the flooding and ponding, this soil is unsuited to use as a site for dwellings.

Septic tank absorption fields

Management measures or considerations:

- Because of the flooding and ponding, this soil is unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 5w

3108A—Bonnie silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Toeslopes
Flooding frequency: Frequent
Flooding duration: Brief
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Very poorly drained
Permeability: Moderately slow
Parent material: Silty alluvium
Runoff: Very slow
Available water capacity: Very high
Seasonal high water table: 1 foot above to 1 foot below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: None or slight
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 5 inches—brown silt loam

Figure 3.—Because of long periods of ponding, areas of Bonnie silt loam, undrained, 0 to 2 percent slopes, frequently flooded, are generally poorly suited to commercial timber production. This map unit is suited to use as habitat for wildlife.

5 to 10 inches—mixed light brownish gray and dark grayish brown silt loam

Substratum:
10 to 60 inches—gray and light gray silt loam

Composition

Bonnie soil and similar inclusions: 100 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Bonnie soil
- Soils that are less acid than the Bonnie soil
- Soils that have a seasonal high water table at a depth of more than 1 foot

Use and Management

Cropland
Management concerns: Wetness, flooding, and tilth
Management measures or considerations:
- A well maintained surface drainage system reduces wetness and helps to protect the soil from flooding during the growing season.
- Tilling when the soil is wet causes surface cloddiness and compaction, increases runoff and erosion, and reduces the rate of water infiltration.

• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness, flooding, and tilth
Management measures or considerations:
• A cover of grasses and legumes improves tilth and helps to control erosion.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
• Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
• The use of machinery is limited to periods when the soil is firm enough to support the equipment.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
• Wildlife habitat should be protected from fire and from livestock grazing.
• Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
• Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
• This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management measures or considerations:
• Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

Septic tank absorption fields
Management measures or considerations:
• Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 3w

Cape Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Flood plains
Position on the landform: Toeslopes
Parent material: Clayey slackwater sediments
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, acid, mesic Vertic Endoaquepts

Typical Pedon

Cape silty clay loam, 0 to 2 percent slopes, frequently flooded, 2,000 feet south and 1,060 feet west of the northeast corner of sec. 18, T. 7 S., R. 2 E., Franklin County, Illinois:

Ap1—0 to 3 inches; dark grayish brown (10YR 4/2) silty clay loam; weak fine granular structure; friable; very fine roots throughout; common fine rounded soft masses of iron-manganese; neutral; abrupt smooth boundary.

Ap2—3 to 7 inches; 90 percent very dark grayish brown (10YR 3/2) and 10 percent brown (10YR 5/3) silty clay loam; strong fine and medium angular blocky structure; friable; common very fine roots throughout; few fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine rounded soft masses of iron-manganese; slightly acid; clear smooth boundary.

Bg1—7 to 17 inches; grayish brown (10YR 5/2) silty clay; moderate fine and medium prismatic structure; firm; few very fine roots between peds; few prominent brown (7.5YR 4/4) continuous iron stains in root channels and/or pores; common faint grayish brown (10YR 5/2) nonintersecting slickensides on faces of peds and in pores; common fine and medium faint pale brown (10YR 6/3) and common prominent yellowish brown (10YR 5/6) and strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine rounded soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Bg2—17 to 46 inches; 60 percent gray (10YR 6/1) and 40 percent brown (10YR 5/3) silty clay; moderate fine and medium prismatic structure; very firm; few very fine roots between peds; very few prominent brown and dark brown (7.5YR 4/4) patchy iron stains in root channels and/or pores; few distinct gray (10YR 5/1) nonintersecting slickensides in root channels and/or pores; many fine and medium distinct pale brown (10YR 6/3) and prominent yellowish brown (10YR 5/6) and common medium and coarse prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; common fine rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

Bg3—46 to 59 inches; gray (10YR 6/1) silty clay; moderate medium prismatic structure; very firm; few very fine roots between peds; very few prominent brown and dark brown (7.5YR 4/4) patchy iron stains in root channels and/or pores; few distinct grayish brown (10YR 5/2) nonintersecting slickensides on faces of peds and in pores; few distinct gray (10YR 5/1) nonintersecting slickensides in root channels and/or pores; common fine and medium distinct brown (10YR 5/3) masses of iron accumulation in the matrix; common fine rounded soft masses of iron-manganese; strongly acid; clear smooth boundary.

Bg4—59 to 64 inches; light brownish gray (10YR 6/2) silty clay; strong fine and medium prismatic structure; firm; few fine roots between peds; few distinct very dark gray (10YR 3/1) continuous manganese or iron-manganese stains in root channels and/or pores; many distinct gray (10YR 5/1) nonintersecting slickensides in root channels and/or pores; common fine and medium faint brown (10YR 5/3) masses of iron accumulation and gray (10YR 6/1) iron depletions in the matrix; common fine rounded soft masses of iron-manganese; strongly acid.

Range in Characteristics

Depth to bedrock: More than 60 inches

A or Ap horizon:
Hue—10YR or 2.5YR
Value—3 to 6
Chroma—1 to 3
Texture—silty clay loam

Bg horizon:
Hue—10YR or 2.5YR
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, silty clay, or clay

3422A—Cape silty clay loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Toeslopes
Flooding frequency: Frequent
Flooding duration: Brief
Major uses: Cropland and woodland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Clayey slackwater sediments
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: 1 foot above to 1 foot below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 3 inches—dark grayish brown silty clay loam
3 to 7 inches—mixed very dark grayish brown and brown silty clay loam

Subsoil:
7 to 17 inches—grayish brown silty clay
17 to 46 inches—mixed gray and brown silty clay
46 to 59 inches—gray silty clay
59 to 64 inches—light brownish gray silty clay

Composition

Cape soil and similar inclusions: 95 percent
Contrasting inclusions: 5 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Cape soil
- Soils that contain more clay or less clay than the Cape soil
- Soils that have a seasonal high water table at a depth of more than 1 foot and that are less frequently flooded than the Cape soil; in the higher areas

Contrasting inclusions:
- The very poorly drained Bonnie or Jacob soils in small depressions that are subject to ponding

Use and Management

Cropland
Management concerns: Wetness, flooding, and tilth
Management measures or considerations:
- A well maintained surface drainage system reduces the wetness and helps to protect the soil from flooding during the growing season.

- Tilling when the soil is wet causes surface cloddiness and compaction, increases runoff and erosion, and reduces the rate of water infiltration.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness, flooding, and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The use of machinery is limited to periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management measures or considerations:
- Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

Septic tank absorption fields
Management measures or considerations:
- Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 3w

Chauncey Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landform: Uplands
Position on the landform: Footslopes and shallow closed depressions
Parent material: Loess over depositional sediments
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Typic Argialbolls

Typical Pedon

Chauncey silt loam, 1,480 feet north and 940 feet west of the southeast corner of sec. 24, T. 3 S., R. 3 E., Jefferson County, Illinois:

Ap—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; common very fine and fine roots throughout; few distinct dark yellowish brown (10YR 4/6) patchy iron stains on faces of peds and in pores; common fine rounded iron-manganese concretions; neutral; abrupt smooth boundary.

A—5 to 12 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate thick platy structure parting to moderate very fine subangular blocky; friable; common very fine and fine roots throughout; very few distinct dark yellowish brown (10YR 4/6) patchy iron stains on faces of peds and in pores and faint very dark brown (10YR 2/2) organic coats; common fine and medium faint gray (10YR 5/1) iron depletions in the matrix; common fine and medium rounded iron-manganese concretions; neutral; abrupt smooth boundary.

Eg1—12 to 17 inches; dark gray (10YR 4/1) silt loam; weak thin platy structure parting to moderate fine subangular blocky; friable; common very fine and fine roots throughout; very few prominent dark yellowish brown (10YR 4/6) patchy iron stains on faces of peds and in pores and distinct very dark brown (10YR 2/2) organic coats; common fine and medium faint grayish brown (10YR 5/2) and distinct brown (10YR 4/3) masses of iron accumulation in the matrix; common fine and medium rounded iron-manganese concretions; slightly acid; clear smooth boundary.

Eg2—17 to 26 inches; gray (10YR 5/1) silt loam; moderate medium subangular blocky structure; friable; common very fine and fine roots throughout; few prominent yellowish brown (10YR 5/4) and few dark yellowish brown (10YR 4/6) discontinuous iron stains on faces of peds and in pores; common fine and medium faint grayish brown (2.5Y 5/2) masses of iron accumulation and common dark gray (10YR 4/1) iron depletions in the matrix; common fine and medium irregular soft masses of iron-manganese and common fine and medium rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

Btg1—26 to 31 inches; gray (10YR 5/1) silty clay loam; moderate medium subangular blocky structure; firm; common very fine and fine roots between peds; common faint dark gray (10YR 4/1) continuous clay films (cutans) on faces of peds and in pores, few distinct light gray (10YR 7/2) patchy skeletans (silt), and few prominent dark gray (10YR 4/1) discontinuous iron stains; common fine and medium faint dark grayish brown (10YR 4/2) masses of iron accumulation in the matrix; common fine and medium irregular soft masses of iron-manganese and common fine and medium rounded iron-manganese concretions; very strongly acid; clear wavy boundary.

Btg2—31 to 46 inches; grayish brown (2.5Y 5/2) silty clay; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm; common very fine and fine roots between peds; common prominent dark grayish brown (10YR 4/2) continuous clay films on faces of peds and in pores, few strong brown (7.5YR 5/6) discontinuous iron stains, and few distinct very dark gray (10YR 3/1) patchy organic coats; common medium and coarse irregular soft masses of iron-manganese and common fine and medium rounded iron-manganese concretions; very strongly acid; gradual wavy boundary.

2Btg3—46 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots between peds; few prominent dark grayish brown (10YR 4/2) continuous clay films on faces of peds and in pores; strong brown (7.5YR 5/6) discontinuous iron stains and very few prominent very dark gray (10YR 3/1) discontinuous organic coats in root channels and/or pores; common medium and coarse

irregular soft masses of iron-manganese and few fine cylindrical barite crystals; very strongly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 15 inches
Thickness of the loess: 50 to more than 60 inches
Depth to bedrock: More than 60 inches

A or Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 or 2
Texture—silt loam

Eg horizon:
Hue—10YR
Value—4 to 7
Chroma—1 or 2
Texture—silt loam

Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay or silty clay loam

287A—Chauncey silt loam, 0 to 2 percent slopes

Setting

Landform: Uplands
Position on the landform: Footslopes and shallow closed depressions
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Slow
Parent material: Loess over depositional sediments
Runoff: Slow or very slow
Available water capacity: High
Seasonal high water table: Perched at the surface to 2 feet below the surface
Organic matter content: Moderate
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 5 inches—very dark grayish brown silt loam
5 to 12 inches—very dark grayish brown silt loam

Subsurface layer:
12 to 17 inches—dark gray silt loam
17 to 26 inches—gray silt loam

Subsoil:
26 to 31 inches—gray silty clay loam

31 to 46 inches—grayish brown silty clay
46 to 60 inches—grayish brown silty clay loam

Composition

Chauncey soil and similar inclusions: 100 percent

Inclusions

Similar inclusions:
- Soils that have a lighter colored surface layer than that of the Chauncey soil
- Soils that are shallower over a claypan than the Chauncey soil
- Soils that have a seasonal high water table at a depth of more than 2 feet

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The use of machinery is limited to periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability

Management measures or considerations:

- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2w

Cisne Series

Depth class: Very deep

Drainage class: Poorly drained

Permeability: Very slow

Landform: Uplands and benches

Position on the landform: Broad flats and depressions on divides

Parent material: Loess over glacial drift

Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Mollic Albaqualfs

Typical Pedon

Cisne silt loam, 0 to 2 percent slopes, 45 feet south and 150 feet west of the northeast corner of sec. 4, T. 7 S., R. 1 E., Franklin County, Illinois:

Ap—0 to 8 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; common fine roots throughout; slightly alkaline; clear smooth boundary.

Eg—8 to 20 inches; light brownish gray (10YR 6/2) silt loam; weak medium granular structure; friable; common fine roots throughout; common fine rounded iron-manganese concretions; moderately acid; clear smooth boundary.

B/E—20 to 23 inches; grayish brown (10YR 5/2) and light gray (10YR 7/2) silty clay loam; strong fine and medium subangular blocky structure; firm, brittle; few fine roots throughout; few distinct gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; common fine prominent strong brown (7.5YR 4/6) and yellowish red (5YR 5/6) and common fine faint brown (10YR 5/3) masses of iron accumulation in the matrix; common fine rounded iron-manganese concretions; very strongly acid; abrupt smooth boundary.

Btg1—23 to 27 inches; gray (10YR 5/1) and grayish brown (10YR 5/2) silty clay; moderate medium subangular blocky structure; very firm; few fine roots throughout; few distinct gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine irregular iron-manganese concretions; very strongly acid; clear smooth boundary.

Btg2—27 to 40 inches; gray (10YR 5/1) silty clay; weak medium prismatic structure; firm; few fine roots throughout; few distinct gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; common fine prominent yellowish brown (10YR 5/6 and 5/4) masses of iron accumulation in the matrix; common fine irregular iron-manganese concretions; very strongly acid; gradual smooth boundary.

2Ab—40 to 49 inches; very dark gray (10YR 3/1) silt loam; weak medium prismatic structure; firm; common fine and medium faint dark gray (10YR 4/1) iron depletions in the matrix; common fine and medium irregular iron-manganese concretions; few fine and medium irregular barite crystals; slightly acid; gradual smooth boundary.

2Btgb—49 to 60 inches; gray (10YR 5/1) silty clay loam; weak medium prismatic structure; firm; few distinct gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; common fine and medium distinct yellowish brown (10YR 5/4 and 5/6) masses of iron accumulation in the matrix; many fine and medium irregular iron-manganese concretions; few fine and medium irregular barite crystals; slightly acid.

Range in Characteristics

Thickness of the dark surface layer: 7 to 9 inches
Thickness of the loess: 30 to 55 inches
Depth to bedrock: More than 60 inches

Ap horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 7
Chroma—1 or 2
Texture—silt loam

Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay

2Btgb or 2Btg horizon:
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, clay loam, loam, or silt loam

2A—Cisne silt loam, 0 to 2 percent slopes

Setting

Landform: Uplands
Position on the landform: Broad flats and depressions on divides
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess over glacial drift
Runoff: Slow or very slow
Available water capacity: High or moderate
Seasonal high water table: Perched at the surface to 2 feet below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—dark brown silt loam

Subsurface layer:
8 to 20 inches—light brownish gray silt loam

Subsoil:
20 to 23 inches—mixed grayish brown and light gray silty clay loam
23 to 27 inches—mixed gray and grayish brown silty clay
27 to 40 inches—gray silty clay
40 to 49 inches—very dark gray silt loam
49 to 60 inches—gray silty clay loam

Composition

Cisne soil and similar inclusions: 100 percent

Inclusions

Similar inclusions:
- Soils that have a lighter colored surface layer than that of the Cisne soil
- Soils that are deeper over a claypan than the Cisne soil
- Soils that have a seasonal high water table at a depth of more than 1 foot

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The use of machinery is limited to periods when the soil is firm enough to support a load.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3w

376A—Cisne silt loam, bench, 0 to 2 percent slopes

Setting

Landform: Benches
Position on the landform: Broad flats and depressions
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess over glacial drift (ablation till, outwash)
Runoff: Slow or very slow
Available water capacity: High or moderate
Seasonal high water table: Perched at the surface to 2 feet below the surface
Organic matter content: Moderate or moderately low
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—very dark grayish brown silt loam

Subsurface layer:
7 to 16 inches—grayish brown silt loam

Subsoil:
16 to 18 inches—grayish brown silty clay loam and white silt
18 to 34 inches—gray silty clay loam
34 to 43 inches—grayish brown silt loam
43 to 64 inches—grayish brown silt loam

Composition

Cisne soil and similar inclusions: 95 to 100 percent
Contrasting inclusions: 0 to 5 percent

Inclusions

Similar inclusions:
- Soils that have a lighter colored surface layer than that of the Cisne soil
- Soils that are deeper over a claypan than the Cisne soil
- Soils that have a seasonal high water table at a depth of more than 2 feet

Contrasting inclusions:
- The poorly drained Okaw soils in closed depressions and at the head of drainageways

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The use of machinery is limited to periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability

Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3w

Colp Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Landform: Interfluves and side slopes
Position on the landform: Terraces
Parent material: Loess over lacustrine sediments
Slope range: 2 to 18 percent

Taxonomic classification: Fine, smectitic, mesic Aquertic Chromic Hapludalfs

Typical Pedon

Colp silt loam, 2 to 5 percent slopes, 2,175 feet west and 924 feet north of the southeast corner of sec. 35, T. 7 S., R. 1 E., Franklin County, Illinois:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak fine granular structure; friable; common very fine and fine roots throughout; neutral; abrupt smooth boundary.

BE—7 to 13 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; very firm; few very fine and fine roots throughout; few faint strong brown (7.5YR 4/6) discontinuous clay films on faces of peds and in pores; neutral; clear smooth boundary.

2Bt1—13 to 22 inches; yellowish brown (10YR 5/4) silty clay; moderate medium prismatic structure; very firm; few very fine and fine roots throughout; common faint strong brown (7.5YR 4/6) discontinuous clay films on faces of peds and in pores; many medium and coarse distinct yellowish brown (10YR 5/6) masses of iron accumulation and common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine cylindrical soft masses of iron-manganese; strongly acid; clear smooth boundary.

2Bt2—22 to 37 inches; brown (10YR 5/3) silty clay; moderate medium prismatic structure; very firm; few very fine and fine roots throughout; common faint light olive brown (2.5Y 5/4) discontinuous clay films on faces of peds and in pores; many medium and coarse faint light olive brown (2.5Y 5/4) masses of iron accumulation and grayish brown (10YR 5/2) iron depletions in the matrix; few fine cylindrical soft masses of iron-manganese; very strongly acid; clear smooth boundary.

2Btg1—37 to 45 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; common faint dark grayish brown (2.5Y 4/2) discontinuous clay films on faces of peds and in pores; common fine distinct light olive brown (2.5Y 5/4) masses of iron accumulation in the matrix; common fine cylindrical soft masses of iron-manganese; strongly acid; gradual smooth boundary.

2Btg2—45 to 60 inches; weak red (2.5YR 5/2) silty clay; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; common faint dark grayish brown (2.5Y 4/2) discontinuous clay films on faces of peds and in pores; common fine prominent light olive brown (2.5Y 5/6) masses of iron accumulation in the matrix; many medium and coarse irregular soft masses of iron-manganese; moderately alkaline.

Range in Characteristics

Thickness of the loess: 0 to 20 inches
Depth to bedrock: More than 60 inches
Depth to carbonates: More than 42 inches

Ap or A horizon:
Hue—10YR
Value—3 to 5
Chroma—1 to 4
Texture—silt loam or silty clay loam

E horizon (if it occurs):
Hue—10YR
Value—5 or 6
Chroma—2 to 4
Texture—silt loam or silty clay loam

2Bt horizon:
Hue—10YR, 7.5YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam, silty clay, clay, or clay loam

2Btg horizon:
Hue—2.5YR to 2.5Y
Value—4 to 6
Chroma—2
Texture—silty clay loam, silty clay, clay, or clay loam

122B—Colp silt loam, 2 to 5 percent slopes

Setting

Landform: Terraces
Position on the landform: Convex ridgetops on interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Slow
Parent material: Loess over lacustrine sediments
Runoff: Medium
Available water capacity: Moderate or high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—brown silt loam

Subsoil:
7 to 13 inches—strong brown silty clay loam
13 to 22 inches—yellowish brown silty clay

22 to 37 inches—brown silty clay
37 to 45 inches—grayish brown silty clay
45 to 60 inches—weak red silty clay

Composition

Colp soil and similar inclusions: 100 percent

Inclusions

Similar inclusions:
- Soils that have more loess than the Colp soil
- Soils that are less sloping than the Colp soil
- Soils that are more severely eroded than the Colp soil
- Soils that have a seasonal high water table within a depth of 2 feet

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include canarygrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: The shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability

Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3e

122B2—Colp silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Terraces
Position on the landform: Side slopes
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Slow
Parent material: Loess over lacustrine sediments
Runoff: Medium
Available water capacity: Moderate or high
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Moderately low
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—grayish brown silt loam mixed with yellowish brown silty clay loam

Subsoil:
6 to 8 inches—mixed light brownish gray and yellowish brown silty clay loam
8 to 35 inches—yellowish brown silty clay
35 to 60 inches—light brownish gray silty clay

Composition

Colp soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that have more loess than the Colp soil
- Soils that are more sloping than the Colp soil
- Soils that are more severely eroded than the Colp soil
- Soils that have a seasonal high water table within a depth of 2 feet

Contrasting inclusions:
- Soils that are more sandy than the Colp soil
- The very poorly drained Jacob soils on flood plains adjacent to side slopes

Use and Management

Cropland
Management concerns: Erosion and tilth

Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include canarygrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: The shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3e

122C3—Colp silty clay loam, 5 to 10 percent slopes, severely eroded

Setting

Landform: Terraces
Position on the landform: Side slopes
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately drained

Permeability: Slow
Parent material: Lacustrine sediments
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 3 inches—dark grayish brown silty clay loam
3 to 7 inches—dark grayish brown silty clay

Subsoil:
7 to 18 inches—dark yellowish brown silty clay
18 to 27 inches—dark brown clay
27 to 48 inches—yellowish brown silty clay
48 to 60 inches—grayish brown, calcareous silty clay

Composition

Colp soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that have more loess than the Colp soil
- Soils that are more sloping than the Colp soil
- Soils that are less severely eroded than the Colp soil
- Soils that have a seasonal high water table within a depth of 2 feet

Contrasting inclusions:
- The very poorly drained Jacob soils, which are subject to frequent flooding; on flood plains adjacent to side slopes
- The poorly drained Cape soils, which are subject to frequent flooding; on toeslopes adjacent to side slopes

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include canarygrass, tall fescue, red clover, and switchgrass.

Forestland

Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: The shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 4e

122D3—Colp silty clay loam, 10 to 18 percent slopes, severely eroded

Setting

Landform: Terraces
Position on the landform: Side slopes
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Slow
Parent material: Lacustrine sediments
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 4 inches—brown silty clay loam

Subsoil:
4 to 20 inches—grayish brown silty clay
20 to 30 inches—light olive brown clay
30 to 37 inches—grayish brown silty clay
37 to 49 inches—dark grayish brown silty clay
49 to 60 inches—dark grayish brown, calcareous silty clay

Composition

Colp soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that are more sloping than the Colp soil
- Soils that are less severely eroded than the Colp soil
- Soils that have a seasonal high water table within a depth of 2 feet

Contrasting inclusions:
- The very poorly drained Jacob soils, which are subject to frequent flooding; on flood plains adjacent to side slopes
- The poorly drained Cape soils, which are subject to frequent flooding; on toeslopes adjacent to side slopes

Use and Management

Cropland
Suitability: Generally unsuited

Pasture
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include canarygrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: The shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 6e

Creal Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Uplands
Position on the landform: Footslopes and shallow closed depressions
Parent material: Loess over depositional sediments
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs

Typical Pedon

Creal silt loam, 0 to 2 percent slopes, 820 feet north and 300 feet west of the southeast corner of sec. 15, T. 7 S., R. 2 E., Franklin County, Illinois:

Ap—0 to 6 inches; brown 10YR 4/3) silt loam; moderate medium platy structure parting to weak fine granular; friable; common very fine roots throughout; rounded soft masses of iron-manganese; neutral; clear smooth boundary.

E—6 to 25 inches; brown (10YR 5/3) silt loam; many fine and medium faint pale brown (10YR 6/3) mottles; weak medium platy structure; friable; common very fine roots throughout; few fine rounded soft masses of iron-manganese; slightly acid; clear smooth boundary.

BE—25 to 29 inches; light brownish gray (10YR 6/2) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots between peds; few distinct gray (10YR 5/1) continuous clay films on faces of peds and in pores; few light gray (10YR 7/2) (dry) patchy skeletans on faces of peds and in pores; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium rounded soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Btg1—29 to 37 inches; gray (10YR 6/1) and light brownish gray (10YR 6/2) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots between peds; common faint gray (10YR 6/1) continuous clay films on faces of peds and in pores; few distinct gray (10YR 5/1) and few light gray (10YR 7/2) patchy skeletans on faces of peds; common medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium rounded soft masses of iron-manganese; very strongly acid; abrupt wavy boundary.

Btg2—37 to 50 inches; light brownish gray (10YR 6/2) silt loam; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots between peds; few faint gray (10YR 6/1) discontinuous clay films on faces of peds and in pores; many light gray (10YR 7/1) skeletans on faces of peds and in pores; common fine prominent yellowish brown (10YR 5/6 and 5/8) masses of iron accumulation in the matrix; common medium rounded soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Btg3—50 to 58 inches; gray (10YR 6/1) silt loam; moderate coarse prismatic structure parting to strong fine and medium angular blocky; firm; few faint gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; many medium prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; many prominent black (N 2/0) manganese or iron-manganese stains; common medium rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

2Btg4—58 to 65 inches; light brownish gray (10YR 6/2) silt loam; weak coarse prismatic structure; firm, brittle; few faint gray (10YR 5/1) patchy clay films on faces of peds and in pores; many medium prominent dark yellowish brown (10YR 4/6) masses of iron accumulation in the matrix; common prominent black (N 2/0) discontinuous manganese or iron-manganese stains; common fine irregular barite crystals; common medium rounded soft masses of iron-manganese; strongly acid.

Range in Characteristics

Thickness of the loess: 50 to 60 inches
Depth to bedrock: More than 60 inches

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam

E or Eg horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam

Btg or Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam or silt loam

2Btg or 2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or silty clay loam

337A—Creal silt loam, 0 to 2 percent slopes

Setting

Landform: Uplands
Position on the landform: Footslopes and shallow closed depressions
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Loess over depositional sediments
Runoff: Slow
Available water capacity: High

Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: None or slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—brown silt loam

Subsurface layer:
6 to 25 inches—brown silt loam

Subsoil:
25 to 29 inches—light brownish gray silty clay loam
29 to 37 inches—mixed gray and light brownish gray silty clay loam
37 to 50 inches—light brownish gray silt loam
50 to 58 inches—gray silt loam
58 to 65 inches—light brownish gray silt loam

Composition

Creal soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Creal soil
- Soils that are less than 24 inches deep over a claypan
- Soils that are more sloping than the Creal soil
- Soils that have a seasonal high water table within a depth of 1 foot

Contrasting inclusions:
- The moderately well drained Richview soils on knolls and shoulders of uplands
- The well drained Pike soils on convex side slopes of uplands

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: Wetness

Management measures or considerations:
- Onsite investigation is needed.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability

Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2w

536—Dumps, mine

Setting

Position on the landform: Upland areas modified by coal mining and preparation activities
Shape of areas: Rectangular
Major use: Storage of refuse adjacent to coal mines

Properties and Qualities

- This map unit occurs as nearly level to very steep areas of coarse refuse deposits derived from the washing and separation of coal.

Composition

Dumps, mine, and similar inclusions: 95 to 100 percent
Contrasting inclusions: 0 to 5 percent

Inclusions

Similar inclusions:
- Small amounts of coal, sandstone, shale, and pyrite mixed in with the gob

Contrasting inclusions:
- Small areas of silty Orthents that have been disturbed as a result of mine development

Use and Management

- Most areas support little vegetation. Areas on the lower slopes near the perimeter may support plants that grow under extremely acid conditions. Some areas are reclaimed. They are covered with about 4 feet of soil material, which provides a growing medium for various plants.

Interpretive Groups

Land capability classification: Not assigned

866—Dumps, slurry

Setting

Landform: Uplands
Position on the landform: Areas modified by the activities of coal preparation plants
Shape of areas: Rectangular
Size of areas: 8 to 25 acres
Major use: Slurry storage adjacent to coal mines

Soil Properties and Qualities

- This map unit occurs as nearly level areas of loamy refuse material that has settled out from slurry derived from coal preparation plants. The slurry is pumped into a pond or into a box cut. Pumping continues until mining activities have ceased or until the pond or box cut has filled. In most areas the material then undergoes oxidation for several years and becomes strongly acid to extremely acid.

Composition

Dumps, slurry: 100 percent

Use and Management

- Most areas support little or no vegetation. Some areas support plants that grow under extremely acid conditions.

Interpretive Groups

Land capability classification: Not assigned

Grantsburg Series

Depth class: Moderately deep to a fragipan and very deep to bedrock
Drainage class: Moderately well drained
Permeability: Very slow
Landform: Uplands
Position on the landform: Convex ridgetops and side slopes on interfluves
Parent material: Loess and silty sediments over bedrock
Slope range: 2 to 10 percent

Taxonomic classification: Fine-silty, mixed, active, mesic Oxyaquic Fragiudalfs

Typical Pedon

Grantsburg silt loam, 2 to 5 percent slopes, 600 feet south and 1,313 feet west of the northeast corner of sec. 10, T. 2 S., R. 3 E., Jefferson County, Illinois:

Ap—0 to 4 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; few fine roots throughout; strongly acid; abrupt smooth boundary.
E—4 to 9 inches; strong brown (7.5YR 5/6) silt loam; weak medium subangular blocky structure; friable; few fine roots throughout; extremely acid; clear smooth boundary.
Bt1—9 to 19 inches; strong brown (7.5YR 5/6) silty clay loam; moderate fine and medium subangular blocky structure; firm; few fine roots throughout; few distinct

strong brown (7.5YR 4/6) discontinuous clay films on faces of peds and in pores; extremely acid; clear smooth boundary.

Bt2—19 to 27 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine and medium subangular blocky structure; firm; very few distinct light gray (10YR 7/1) discontinuous skeletans (silt) on faces of peds and in pores; few distinct strong brown (7.5YR 4/6) discontinuous clay films on faces of peds; common fine rounded iron-manganese concretions; extremely acid; abrupt smooth boundary.

B/E—27 to 29 inches; yellowish brown (10YR 5/6) and pale brown (10YR 6/3) silty clay loam (Bt); light gray (10YR 7/1) (dry) silt (E); moderate medium subangular blocky structure; firm; few faint brown (10YR 5/3) discontinuous clay films on faces of peds and in pores (mostly masked by silt coatings); common fine and medium rounded iron-manganese concretions; extremely acid; abrupt smooth boundary.

B´t—29 to 37 inches; dark yellowish brown (10YR 4/4) silty clay loam; weak medium prismatic structure parting to weak medium platy; very firm; very few distinct light gray (10YR 7/1) patchy skeletans (silt) on faces of peds and in pores; few faint strong brown (7.5YR 4/6) patchy clay films on faces of peds and in pores; many fine and medium distinct grayish brown (10YR 5/2) iron depletions and common fine distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium irregular iron-manganese concretions; very strongly acid; gradual smooth boundary.

2Bx—37 to 60 inches; strong brown (7.5YR 4/6) silt loam; common medium prominent grayish brown (10YR 5/2) iron depletions in the matrix; weak coarse prismatic structure; very firm; brittle; common fine and medium irregular iron-manganese concretions; very strongly acid.

Range in Characteristics

Thickness of the loess: 36 to 60 inches
Depth to bedrock: 60 to 120 inches
Depth to the fragipan: 24 to 40 inches

A or Ap horizon:
Hue—10YR
Value—3 to 5
Chroma—2 to 5
Texture—silt loam

E horizon:
Hue—10YR or 7.5YR
Value—5 or 6
Chroma—3 or 4
Texture—silt loam

BE horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam or silty clay loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam or silty clay loam

B/E horizon:
Hue—10YR or 7.5YR
Value—4 to 8

Chroma—1 to 6
Texture—silt loam, silt, or silty clay loam

B´t horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—4 to 6
Texture—silty clay loam

2Btx or 2Bx horizon:
Hue—10YR or 7.5YR
Value—4 to 7
Chroma—4 to 6
Texture—silt loam or silty clay loam

301B—Grantsburg silt loam, 2 to 5 percent slopes

Setting

Landform: Uplands
Position on the landform: Convex ridgetops on interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Loess and silty sediments over bedrock
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: Perched at a depth of 1.5 to 3.5 feet
Organic matter content: Low or moderately low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 4 inches—brown silt loam

Subsurface layer:
4 to 9 inches—strong brown silt loam

Subsoil:
9 to 19 inches—strong brown silty clay loam
19 to 27 inches—yellowish brown silty clay loam
27 to 29 inches—mixed yellowish brown and pale brown silty clay loam
29 to 37 inches—dark yellowish brown silty clay loam
37 to 60 inches—strong brown, brittle silt loam

Composition

Grantsburg soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that are redder and less brittle than the Grantsburg soil

- Soils that are more severely eroded than the Grantsburg soil
- Soils that are more sloping than the Grantsburg soil
- Soils that are 48 to 60 inches deep over bedrock
- Soils that formed in glacial drift

Contrasting inclusions:
- The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes
- The somewhat poorly drained Blair soils at the head of drainageways

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

301C3—Grantsburg silty clay loam, 5 to 10 percent slopes, severely eroded

Setting

Landform: Uplands
Position on the landform: Side slopes
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Loess and silty sediments over bedrock
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: Perched at a depth of 1.5 to 3.5 feet
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown silty clay loam

Subsoil:
5 to 11 inches—strong brown silty clay loam
11 to 17 inches—mixed very pale brown and yellowish brown silty clay loam
17 to 47 inches—yellowish brown, brittle silty clay loam and silt loam
47 to 60 inches—yellowish brown silty clay loam

Composition

Grantsburg soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that are brittle within a depth of 20 inches
- Soils that are more sloping than the Grantsburg soil
- Soils that contain less loess than the Grantsburg soil
- Soils that are less than 80 inches deep over bedrock

Contrasting inclusions:
- The somewhat poorly drained Blair soils at the head of drainageways and on concave side slopes

Use and Management

Cropland
Management concerns: Erosion and tilth

Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion (fig. 4).
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Figure 4.—Contour stripcropping helps to control erosion in an area of Grantsburg silty clay loam, 5 to 10 percent slopes, severely eroded.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 4e

Hickory Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Uplands
Position on the landform: Side slopes
Parent material: Loess over till
Slope range: 10 to 35 percent

Taxonomic classification: Fine-loamy, mixed, active, mesic Typic Hapludalfs

Typical Pedon

Hickory silt loam, in an area of Hickory-Kell silt loams, 18 to 35 percent slopes, 1,979 feet west and 1,173 feet north of the southeast corner of sec. 15, T. 3 S., R. 3 E., Jefferson County, Illinois:

A—0 to 3 inches; dark brown (10YR 3/3) silt loam, pale brown (10YR 6/3) dry; weak fine granular structure; friable; common fine and medium roots throughout; very strongly acid; clear smooth boundary.

E—3 to 11 inches; brown (10YR 4/3) silt loam; weak thick platy structure; friable; few fine and medium roots throughout; very strongly acid; clear smooth boundary.

EB—11 to 16 inches; dark yellowish brown (10YR 4/4) silt loam; weak thick platy structure parting to weak medium subangular blocky; friable; few fine and medium roots between peds; very strongly acid; clear smooth boundary.

Bt1—16 to 23 inches; strong brown (7.5YR 5/6) loam; moderate medium subangular blocky structure; friable; few fine and medium roots between peds; few distinct brown (10YR 4/3) and few dark yellowish brown (10YR 3/4) continuous clay films on faces of peds and in pores; very strongly acid; 5 percent sedimentary pebbles; clear smooth boundary.

Bt2—23 to 36 inches; strong brown (7.5YR 5/6) clay loam; moderate medium subangular blocky structure; firm; few medium and coarse roots throughout; few distinct brown (10YR 4/3) and few dark yellowish brown (10YR 3/4) continuous

clay films on faces of peds and in pores; few brown and dark brown (7.5YR 4/4) discontinuous iron stains; very strongly acid; 10 percent igneous pebbles; 5 percent sedimentary pebbles; clear smooth boundary.

Bt3—36 to 43 inches; yellowish brown (10YR 5/6) clay loam; moderate medium angular blocky structure; firm; few distinct dark yellowish brown (10YR 3/4) continuous clay films on faces of peds and in pores; prominent dark reddish brown (5YR 2/2) patchy manganese or iron-manganese stains and few yellowish red (5YR 4/6) discontinuous iron stains; very strongly acid; 10 percent igneous pebbles; 10 percent sedimentary pebbles; gradual smooth boundary.

Bt4—43 to 52 inches; yellowish brown (10YR 5/6) loam; common coarse prominent light gray (10YR 7/2) mottles; moderate medium subangular blocky structure; firm; few distinct dark yellowish brown (10YR 3/4) continuous clay films on faces of peds and in pores; prominent dark reddish brown (5YR 2/2) patchy manganese or iron-manganese stains and very few yellowish red (5YR 4/6) discontinuous iron stains; very strongly acid; 5 percent igneous pebbles; 10 percent sedimentary pebbles; abrupt smooth boundary.

Bt5—52 to 60 inches; yellowish brown (10YR 5/6) loam; few coarse prominent light gray (10YR 7/2) mottles; strong medium subangular blocky structure; very firm; few distinct dark yellowish brown (10YR 3/4) discontinuous clay films on faces of peds and in pores; many prominent dark reddish brown (5YR 2/2) continuous manganese or iron-manganese stains; very strongly acid; 5 percent igneous pebbles; 10 percent sedimentary pebbles.

Range in Characteristics

Thickness of the loess: 0 to 20 inches
Depth to bedrock: More than 60 inches
Depth to carbonates: 40 to 72 inches

A horizon:
Hue—10YR or 7.5YR
Value—2 to 5
Chroma—2 to 4
Texture—silt loam, loam, silty clay loam, or clay loam

E or EB horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or loam

Bt horizon:
Hue—10YR, 7.5YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—clay loam, silty clay loam, or loam

C horizon (if it occurs):
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 6
Texture—loam, clay loam, sandy loam, or the gravelly analogs of these textures

8D3—Hickory clay loam, 10 to 18 percent slopes, severely eroded

Setting

Landform: Uplands
Position on the landform: Side slopes
Major use: Pasture

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: At a depth of more than 6 feet
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 8 inches—mixed brown and yellowish brown clay loam

Subsoil:
8 to 48 inches—yellowish brown clay loam
48 to 79 inches—yellowish brown sandy clay loam

Composition

Hickory soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that are more sloping than the Hickory soil
- Soils that are less severely eroded than the Hickory soil

Contrasting inclusions:
- The somewhat poorly drained Blair soils at the head of drainageways and on the upper concave side slopes
- Kell soils, which are more sloping than the Hickory soil; on the lower side slopes
- The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland

Management measures or considerations:
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: The shrink-swell potential and the slope
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Land shaping by cutting and filling helps to overcome the slope.

Septic tank absorption fields

Management concerns: Restricted permeability and the slope
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 4e

908F—Hickory-Kell silt loams, 18 to 35 percent slopes

Setting

Landform: Uplands
Position on the landform: Side slopes
Major uses: Pasture and woodland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Hickory—loess over till; Kell—thin loess over glacial drift over material weathered from acid sandstone, siltstone, or shale
Runoff: Rapid
Available water capacity: Hickory—high; Kell—low
Seasonal high water table: At a depth of more than 6 feet

Organic matter content: Moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Hickory
Surface layer:
0 to 3 inches—dark brown silt loam

Subsurface layer:
3 to 11 inches—brown silt loam
11 to 16 inches—dark yellowish brown silt loam

Subsoil:
16 to 23 inches—strong brown loam
23 to 36 inches—strong brown clay loam
36 to 43 inches—yellowish brown clay loam
43 to 60 inches—yellowish brown loam

Kell
Surface layer:
0 to 3 inches—very dark grayish brown silt loam

Subsurface layer:
3 to 7 inches—mixed dark grayish brown and dark yellowish brown silt loam

Subsoil:
7 to 13 inches—yellowish brown loam
13 to 25 inches—yellowish brown silty clay loam
25 to 35 inches—mixed yellowish brown and light brownish gray very channery silty clay loam

Bedrock:
35 to 60 inches—mixed yellowish brown and light brownish gray, weathered bedrock

Composition

Hickory and Kell soils and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that are less sloping
- Soils that are more severely eroded

Contrasting inclusions:
- The somewhat poorly drained Blair soils at the head of drainageways and on the upper concave side slopes
- The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

Use and Management

Cropland
Management measures or considerations:
- Because of the slope, these soils are unsuited to use as cropland.

Pasture
Management concerns: Slope, erosion, and tilth
Management measures or considerations:
- The slope limits the use of equipment and increases the hazard of erosion.
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The slope limits the use of equipment and increases the hazard of erosion.
- Placing logging roads and skid trails on or near the contour and skidding logs or trees uphill with a cable and winch help to overcome the slope.
- Seeding bare areas to grass or to a grass-legume mixture after logging activities reduces the hazard of erosion.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management measures or considerations:
- Because of the slope, these soils are unsuited to use as sites for dwellings.

Septic tank absorption fields
Management measures or considerations:
- Because of the slope, these soils are unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: 6e

Hoyleton Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Uplands and benches
Position on the landform: Broad flats and side slopes on divides
Parent material: Loess over glacial drift
Slope range: 0 to 5 percent

Taxonomic classification: Fine, smectitic, mesic Aquollic Hapludalfs

Typical Pedon

Hoyleton silt loam, 0 to 2 percent slopes, 1,254 feet north and 2,112 feet west of the southeast corner of sec. 21, T. 5 S., R. 3 E., Franklin County, Illinois:

Ap—0 to 7 inches; dark brown (10YR 3/3) silt loam, brown (10YR 5/3) dry; weak fine granular structure; friable; common very fine and fine roots throughout; slightly alkaline; abrupt smooth boundary.

E—7 to 9 inches; brown (10YR 5/3) silt loam; weak fine granular structure; friable; common very fine and fine roots throughout; common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; slightly alkaline; abrupt smooth boundary.

Bt1—9 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; common very fine and fine roots throughout; few faint pale brown (10YR 6/3) discontinuous clay films on faces of peds and in pores; common fine distinct strong brown (7.5YR 5/6) and common fine prominent dark red (2.5YR 3/6) masses of iron accumulation in the matrix; very strongly acid; clear smooth boundary.

Bt2—13 to 17 inches; grayish brown (10YR 5/2) silty clay loam; moderate fine subangular blocky structure; firm; few very fine and fine roots between peds; many distinct white (10YR 8/1) continuous skeletans (silt) on faces of peds and in pores; common faint gray (10YR 5/1) discontinuous clay films on faces of peds and in pores; common fine prominent strong brown (7.5YR 5/6) and common dark red (2.5YR 3/6) masses of iron accumulation in the matrix; extremely acid; abrupt smooth boundary.

Bt3—17 to 22 inches; grayish brown (10YR 5/2) silty clay; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; few very fine and fine roots between peds; common faint gray (10YR 5/1) and few distinct dark brown (7.5YR 3/4) continuous clay films on faces of peds and in pores; common fine and medium prominent dark red (2.5YR 3/6) and fine strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; very strongly acid; clear smooth boundary.

Bt4—22 to 33 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure; very firm; few very fine roots between peds; few distinct dark brown (7.5YR 3/4) continuous clay films on faces of peds and in pores and few prominent white (10YR 8/1) patchy skeletans (silt) on faces of peds; common fine and medium prominent yellowish brown (10YR 5/8) masses of iron accumulation and common fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common fine irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

2BC—33 to 48 inches; dark yellowish brown (10YR 4/4) silt loam; weak coarse prismatic structure parting to weak coarse angular blocky; very firm; brittle; common medium distinct grayish brown (10YR 5/2) iron depletions and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

2CB—48 to 65 inches; yellowish brown (10YR 5/6) loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak coarse prismatic structure parting to weak coarse angular blocky; very firm; brittle; few distinct black (10YR 2/1) discontinuous manganese or iron-manganese stains on faces of peds and in pores; common fine irregular soft masses of iron-manganese; very strongly acid; 1 percent igneous pebbles.

Range in Characteristics

Thickness of the dark surface layer: 6 to 9 inches
Thickness of the loess: 30 to 50 inches
Depth to bedrock: More than 60 inches

Ap horizon:
Hue—10YR

Value—2 or 3
Chroma—1 to 3
Texture—silt loam

E horizon:
Hue—10YR
Value—4 to 6
Chroma—3 or 4
Texture—silt loam

Bt horizon:
Hue—10YR, 7.5YR, or 5YR
Value—4 to 6
Chroma—2 to 4
Texture—silty clay or silty clay loam

2Bt or 2BC horizon:
Hue—10YR
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam, clay loam, loam, or silt loam

3A—Hoyleton silt loam, 0 to 2 percent slopes

Setting

Landform: Uplands
Position on the landform: Broad convex flats on divides
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess over glacial drift
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—dark brown silt loam

Subsurface layer:
7 to 9 inches—brown silt loam

Subsoil:
9 to 13 inches—yellowish brown silty clay loam
13 to 17 inches—grayish brown silty clay loam
17 to 22 inches—grayish brown silty clay
22 to 33 inches—yellowish brown silty clay loam
33 to 48 inches—dark yellowish brown silt loam

Substratum:
48 to 65 inches—yellowish brown loam

Composition

Hoyleton soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a lighter colored surface layer than that of the Hoyleton soil
- Soils that are more sloping than the Hoyleton soil
- Soils that have a seasonal high water table within a depth of 1 foot
- Soils that are deeper over a claypan than the Hoyleton soil

Contrasting inclusions:
- The moderately well drained Ava soils on side slopes and nose slopes of interfluves
- The poorly drained Wynoose soils in shallow closed depressions
- The poorly drained Chauncey soils in shallow closed depressions or on toeslopes

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.

- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2w

3B2—Hoyleton silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Uplands
Position on the landform: Side slopes and summits
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess over glacial drift
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—mixed dark brown and very dark grayish brown silt loam

Subsoil:
7 to 10 inches—brown silty clay loam
10 to 25 inches—yellowish brown silty clay
25 to 39 inches—grayish brown silty clay loam
39 to 58 inches—dark grayish brown silt loam
58 to 78 inches—yellowish brown silt loam

Composition

Hoyleton soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a lighter colored surface layer than that of the Hoyleton soil

- Soils that are less sloping than the Hoyleton soil
- Soils that have a seasonal high water table within a depth of 1 foot

Contrasting inclusions:
- The poorly drained Chauncey soils along footslopes and at the head of drainageways
- The somewhat poorly drained Belknap soils, which are subject to frequent flooding; in narrow, long areas of bottom land in drainageways

Use and Management

Cropland
Management concerns: Erosion, wetness, and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion, wetness, and tilth
Management measures or considerations:
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

377A—Hoyleton silt loam, bench, 0 to 2 percent slopes

Setting

Landform: Benches
Position on the landform: Broad, convex flats
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess over glacial drift (outwash, ablation till)
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—dark brown silt loam

Subsurface layer:
8 to 11 inches—mixed dark yellowish brown and light yellowish brown silt loam

Subsoil:
11 to 16 inches—dark grayish brown silty clay loam
16 to 27 inches—grayish brown silty clay
27 to 41 inches—mixed light brownish gray and yellowish brown silty clay loam
41 to 55 inches—mixed yellowish brown and pale brown silty clay loam
55 to 60 inches—mixed yellowish brown and pale brown silt loam

Composition

Hoyleton soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a lighter colored surface layer than that of the Hoyleton soil
- Soils that are more sloping than the Hoyleton soil
- Soils that are more severely eroded than the Hoyleton soil
- Soils that have a seasonal high water table within a depth of 3 feet

Contrasting inclusions:
- The poorly drained Bonnie soils on narrow flood plains
- The moderately well drained Rend soils on side slopes and nose slopes of

interfluves
- The poorly drained Wynoose soils in shallow closed depressions

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2w

377B2—Hoyleton silt loam, bench, 2 to 5 percent slopes, eroded

Setting

Landform: Benches
Position on the landform: Side slopes
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess over glacial drift (outwash, ablation till)
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: Moderate
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—dark brown silt loam

Subsoil:
6 to 8 inches—dark brown silty clay loam
8 to 12 inches—brown silty clay loam
12 to 22 inches—brown silty clay
22 to 38 inches—brown silty clay loam
38 to 45 inches—light brownish gray silt loam
45 to 66 inches—mixed light brownish gray and yellowish brown silty clay loam

Composition

Hoyleton soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a lighter colored surface layer than that of the Hoyleton soil
- Soils that are more sloping than the Hoyleton soil
- Soils that are more severely eroded than the Hoyleton soil
- Soils that have a seasonal high water table within a depth of 3 feet

Contrasting inclusions:
- The poorly drained Bonnie soils on narrow flood plains
- The moderately well drained Rend soils on side slopes and nose slopes of interfluves
- The poorly drained Wynoose soils in shallow closed depressions

Use and Management

Cropland
Management concerns: Erosion, wetness, and tilth

Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion, wetness, and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

Hurst Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landform: Terraces
Position on the landform: Summits of terrace divides

Parent material: Loess over lacustrine sediments
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs

Typical Pedon

Hurst silt loam, 0 to 2 percent slopes, 2,080 feet west and 180 feet north of the southeast corner of sec. 22, T. 7 S., R. 1 E.

Ap—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; firm; common very fine and fine roots throughout; common fine rounded iron-manganese concretions; slightly alkaline; abrupt smooth boundary.

EA—4 to 8 inches; dark grayish brown (10YR 4/2) silt loam; moderate thick platy structure parting to moderate fine subangular blocky; friable; common very fine and fine roots throughout; common fine faint grayish brown (10YR 5/2) iron depletions in the matrix; common fine rounded iron-manganese concretions; neutral; clear smooth boundary.

2Bt1—8 to 14 inches; brown (10YR 5/3) silty clay loam; moderate fine and medium prismatic structure parting to weak medium subangular blocky; firm; common very fine and fine roots between peds; few prominent yellowish brown (10YR 5/8) discontinuous iron stains; few faint brown (10YR 5/3) continuous clay films and few prominent light gray (10YR 7/2) patchy skeletans (silt) on faces of peds and in pores; common fine and medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common fine rounded iron-manganese concretions; very strongly acid; clear wavy boundary.

2Bt2—14 to 25 inches; brown (10YR 5/3) silty clay; moderate medium prismatic structure parting to weak medium subangular blocky; very firm; common very fine and fine roots between peds; few faint grayish brown (10YR 5/2) and common brown (10YR 5/3) continuous clay films on faces of peds and in pores; few prominent yellowish brown (10YR 5/8) discontinuous iron stains on faces of peds and in pores; common fine and medium faint light brownish gray (10YR 6/2) iron depletions in the matrix; common fine and medium rounded iron-manganese concretions; very strongly acid; gradual wavy boundary.

2Bt3—25 to 38 inches; yellowish brown (10YR 5/4) silty clay; strong medium prismatic structure parting to moderate medium angular blocky; very firm; few very fine and fine roots between peds; many faint brown (10YR 5/3) continuous clay films and few prominent yellowish brown (10YR 5/8) patchy iron stains on faces of peds and in pores; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common fine and medium irregular soft masses of iron-manganese; extremely acid; gradual wavy boundary.

2Btg—38 to 45 inches; light brownish gray (2.5Y 6/2) clay; weak coarse prismatic structure parting to weak medium subangular blocky; extremely firm; few very fine and fine roots between peds; common grayish brown (10YR 5/2) discontinuous clay films and few prominent yellowish brown (10YR 5/8) patchy iron stains on faces of peds and in pores; few fine prominent reddish brown (5YR 4/3) masses of iron accumulation in the matrix; common fine and medium irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

2Cg1—45 to 50 inches; gray (10YR 5/1) clay; many coarse faint grayish brown (10YR 5/2) mottles; massive; extremely firm; few very fine and fine roots between peds; few prominent yellowish brown (10YR 5/8) patchy manganese or iron-manganese stains on faces of peds and in pores; common medium and coarse irregular soft masses of iron-manganese and many medium and coarse rounded iron-manganese concretions; slightly acid; gradual wavy boundary.

2Cg2—50 to 60 inches; gray (10YR 5/1) clay; many coarse faint light brownish gray (10YR 6/2) mottles; massive; extremely firm; few very fine and fine roots between peds; few prominent yellowish brown (10YR 5/8) patchy manganese or iron-manganese stains on faces of peds and in pores; common fine and medium irregular soft masses of iron-manganese; moderately alkaline.

Range in Characteristics

Thickness of the loess: 0 to 24 inches
Depth to bedrock: More than 60 inches
Depth to carbonates: More than 48 inches

Ap or A horizon:
Hue—10YR or 2.5Y
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silty clay loam

E horizon (if it occurs):
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—2 or 3
Texture—silt loam or silty clay loam

2Bt or 2Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam, silty clay, or clay

2Cg or 2C horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam, silty clay, or clay

338A—Hurst silt loam, 0 to 2 percent slopes

Setting

Landform: Terraces
Position on the landform: Summits of terrace divides
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess over lacustrine sediments
Runoff: Slow
Available water capacity: Moderate or high
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: Moderately low
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 4 inches—dark grayish brown silt loam

Subsurface layer:
4 to 8 inches—dark grayish brown silt loam

Subsoil:
8 to 14 inches—brown silty clay loam
14 to 25 inches—brown silty clay
25 to 38 inches—yellowish brown silty clay
38 to 45 inches—light brownish gray clay

Substratum:
45 to 60 inches—gray clay

Composition

Hurst soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that are more sloping than the Hurst soil
- Soils that are subject to rare flooding
- Soils that have a seasonal high water table within a depth of 1 foot

Contrasting inclusions:
- The very poorly drained Jacob soils, which are subject to frequent flooding; on flood plains

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include canarygrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.

- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2w

Jacob Series

Depth class: Very deep
Drainage class: Very poorly drained
Permeability: Very slow
Landform: Flood plains
Position on the landform: Toeslopes
Parent material: Clayey slackwater sediments
Slope range: 0 to 2 percent

Taxonomic classification: Very fine, smectitic, acid, mesic Vertic Endoaquepts

Typical Pedon

Jacob silty clay, 0 to 2 percent slopes, frequently flooded, 2,520 feet east and 2,442 feet south of the northwest corner of sec. 35, T. 7 S., R. 1 E., Franklin County, Illinois:

Ap—0 to 6 inches; very dark gray (10YR 3/1) silty clay; weak fine granular structure; firm; common fine to coarse roots throughout; common fine and medium rounded worm nodules; very strongly acid; abrupt smooth boundary.

Bg1—6 to 41 inches; olive gray (5Y 5/2) clay; weak medium prismatic structure; very firm; common fine roots throughout; few faint olive gray (5Y 5/2) discontinuous nonintersecting slickensides on vertical faces of peds; common medium faint olive (5Y 5/3) masses of iron accumulation in the matrix; few fine irregular soft masses of iron-manganese; extremely acid; clear smooth boundary.

Bg2—41 to 53 inches; olive gray (5Y 5/2) silty clay; weak medium prismatic structure; very firm; few fine roots throughout; few faint olive gray (5Y 5/2) discontinuous nonintersecting slickensides on vertical faces of peds; common fine prominent yellowish brown (10YR 5/6) and common medium faint olive (5Y 5/3) masses of iron accumulation in the matrix; few fine irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Bg3—53 to 60 inches; olive gray (5Y 5/2) clay; moderate medium angular blocky structure; very firm; few very fine roots between peds; few faint olive gray (5Y 5/2)

discontinuous nonintersecting slickensides on vertical faces of peds; common fine prominent yellowish brown (10YR 5/6) and common medium faint olive (5Y 5/3) masses of iron accumulation in the matrix; few fine irregular soft masses of iron-manganese and few fine rounded barite crystals; very strongly acid.

Range in Characteristics

Depth to bedrock: More than 60 inches

Ap or A horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 6
Chroma—0 to 2
Texture—silty clay or clay

Bg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—5 to 7
Chroma—0 to 2
Texture—silty clay or clay

1085A—Jacob silty clay, undrained, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Toeslopes
Flooding frequency: Frequent
Flooding duration: Long
Major uses: Wildlife habitat and woodland

Soil Properties and Qualities

Drainage class: Very poorly drained
Permeability: Very slow
Parent material: Clayey slackwater sediments
Runoff: Ponded
Available water capacity: Moderate
Seasonal high water table: 2.0 feet above to 0.5 foot below the surface
Organic matter content: Moderate
Erosion hazard: None
Shrink-swell potential: Very high
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 2 inches—very dark grayish brown silty clay

Subsoil:
2 to 31 inches—dark gray clay
31 to 43 inches—dark grayish brown silty clay
43 to 60 inches—grayish brown clay

Composition

Jacob soil and similar inclusions: 100 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Jacob soil
- Soils that contain less clay than the Jacob soil
- Soils that have a seasonal high water table at a depth of more than 1 foot; in the higher areas

Use and Management

Cropland
Management measures or considerations:
- Because of the wetness and flooding, this soil is unsuited to use as cropland.

Pasture and hay
Management measures or considerations:
- Because of the wetness and flooding, this soil is unsuited to use for pasture and hay.

Forestland
Management measures or considerations:
- The use of machinery is limited to periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Areas of this soil provide habitat and a water supply for wildlife. Shallow water areas generally are available or can be developed easily.
- During periods when it is flooded, this soil furnishes temporary feeding and nesting sites for waterfowl.
- The habitat should be protected from fire and from livestock grazing.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management measures or considerations:
- Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

Septic tank absorption fields
Management measures or considerations:
- Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 5w

3085A—Jacob silty clay, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Toeslopes
Flooding frequency: Frequent
Flooding duration: Brief
Major uses: Cropland and woodland

Soil Properties and Qualities

Drainage class: Very poorly drained
Permeability: Very slow
Parent material: Clayey slackwater sediments
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: 1 foot above to 1 foot below the surface
Organic matter content: Moderate
Erosion hazard: None or slight
Shrink-swell potential: Very high
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 6 inches—very dark gray silty clay

Subsoil:
6 to 41 inches—olive gray clay
41 to 53 inches—olive gray silty clay
53 to 60 inches—olive gray clay

Composition

Jacob soil and similar inclusions: 95 percent
Contrasting inclusions: 5 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Jacob soil
- Soils that contain less clay than the Jacob soil
- Soils that have a seasonal high water table at a depth of more than 1 foot; in the higher areas that are flooded less frequently than areas of the Jacob soil

Contrasting inclusions:
- Soils in small depressions that are subject to ponding

Use and Management

Cropland
Management concerns: Wetness, flooding, and tilth
Management measures or considerations:
- A well maintained surface drainage system reduces wetness and helps to protect the soil from flooding during the growing season.
- Tilling when the soil is wet causes surface cloddiness and compaction, increases runoff and erosion, and reduces the rate of water infiltration.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness, flooding, and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland

Management measures or considerations:
- The use of machinery is limited to periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings

Management measures or considerations:
- Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

Septic tank absorption fields

Management measures or considerations:
- Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 4w

Kell Series

Depth class: Moderately deep to bedrock
Drainage class: Well drained
Permeability: Moderate
Landform: Uplands
Position on the landform: Side slopes
Parent material: Thin loess or glacial drift over material weathered from acid, sandstone, siltstone, and shale bedrock
Slope range: 18 to 60 percent

Taxonomic classification: Fine-loamy, mixed, active, mesic Ultic Hapludalfs

Typical Pedon

Kell silt loam, in an area of Hickory-Kell silt loams, 18 to 35 percent slopes, 1,975 feet west and 1,175 feet north of the southeast corner of sec. 15, T. 3 S., R. 3 E., Jefferson County, Illinois:

A—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/1) dry; moderate medium granular structure; friable; common very fine and fine roots throughout; moderately acid; abrupt smooth boundary.

E—3 to 7 inches; 60 percent dark grayish brown (10YR 4/2) and 40 percent dark yellowish brown (10YR 4/4) silt loam; weak thin platy structure; friable; common very fine and fine roots; few fine rounded iron-manganese concretions; 1 percent shale pebbles; few subrounded quartz pebbles; moderately acid; clear smooth boundary.

Bt1—7 to 13 inches; yellowish brown (10YR 5/4) silt loam; strong fine subangular blocky structure; friable; common fine and medium roots; very few distinct dark brown (10YR 4/3) iron stains on faces of peds; few distinct brown (10YR 4/3) clay films on faces of peds; common fine rounded iron-manganese concretions; 1 percent shale pebbles; few subrounded quartz pebbles; moderately acid; clear smooth boundary.

2Bt2—13 to 18 inches; yellowish brown (10YR 5/4) silty clay loam; moderate fine subangular blocky structure; friable; few medium roots between peds; many distinct yellowish brown (10YR 5/8) iron stains on faces of peds; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common fine rounded iron-manganese concretions; 1 percent shale pebbles; few subrounded quartz pebbles; very strongly acid; clear smooth boundary.

2Bt3—18 to 25 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few medium roots between peds; few distinct yellowish brown (10YR 5/8) iron stains on faces of peds; few distinct yellowish brown (10YR 5/4) clay films on faces of peds; common fine rounded iron-manganese concretions; 10 percent shale pebbles; few subrounded quartz pebbles; very strongly acid; clear smooth boundary.

2BC—25 to 35 inches; 50 percent yellowish brown (10YR 5/4) and 50 percent light brownish gray (2.5Y 6/2) very channery silty clay loam; massive; firm; few medium roots in cracks; few prominent yellowish brown (10YR 5/8) and reddish yellow (7.5YR 6/6) iron stains on rock fragments; 50 percent shale fragments; extremely acid; gradual wavy boundary.

2Cr—35 to 60 inches; 50 percent yellowish brown (10YR 5/4) and 50 percent light brownish gray (2.5Y 6/2), weathered bedrock; few prominent yellowish brown (10YR 5/8) and reddish yellow (7.5YR 6/6) iron stains on rock fragments.

Range in Characteristics

Depth to bedrock: 20 to 40 inches

A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—silt loam, silty clay loam, loam, or clay loam

E horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam, silty clay loam, loam, or clay loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—4 to 8
Texture—silt loam or silty clay loam

2Bt horizon:
Hue—10YR, 7.5YR, or 2.5Y
Value—4 to 6
Chroma—2 to 8
Texture—silt loam, silty clay loam, loam, or clay loam

2BC horizon:
Hue—10YR, 7.5YR, or 2.5Y
Value—4 to 6

Chroma—2 to 8
Texture—silt loam, silty clay loam, loam, or clay loam

421G—Kell silt loam, 35 to 60 percent slopes

Setting

Landform: Uplands
Position on the landform: Side slopes
Major use: Forestland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Thin loess over glacial drift over material weathered from acid sandstone, siltstone, or shale
Runoff: Very rapid
Available water capacity: Low
Seasonal high water table: At a depth of more than 6 feet
Organic matter content: Moderately low or moderate
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 3 inches—very dark grayish brown silt loam

Subsurface layer:
3 to 7 inches—mixed dark grayish brown and dark yellowish brown silt loam

Subsoil:
7 to 13 inches—yellowish brown loam
13 to 25 inches—yellowish brown silty clay loam
25 to 35 inches—mixed yellowish brown and light brownish gray very channery silty clay loam

Bedrock:
35 to 60 inches—mixed yellowish brown and light brownish gray, weathered bedrock

Composition

Kell soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that are less sloping than the Kell soil
- Soils that contain thicker erosional sediments than those of the Kell soil and are deeper over bedrock
- Soils that have 20 to 40 inches of loess

Contrasting inclusions:
- The somewhat poorly drained Blair and Bluford soils at the head of drainageways and on the upper side slopes

- The moderately well drained Grantsburg and Zanesville soils on the upper convex side slopes

Use and Management

Cropland
Management measures or considerations:
- Because of the slope, this soil is unsuited to use as cropland.

Pasture and hay
Management measures or considerations:
- Because of the slope, this soil is unsuited to use for pasture and hay.

Forestland
Management measures or considerations:
- The slope limits the use of equipment and increases the hazard of erosion.
- Placing logging roads and skid trails on or near the contour and skidding logs or trees uphill with a cable and winch help to overcome the slope.
- Seeding bare areas to grass or to a grass-legume mixture after logging activities reduces the hazard of erosion.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management measures or considerations:
- Because of the slope, this soil is unsuited to use as a site for dwellings.

Septic tank absorption fields
Management measures or considerations:
- Because of the slope, this soil is unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 7e

908F—Hickory-Kell silt loams, 18 to 35 percent slopes

Setting

Landform: Uplands
Position on the landform: Side slopes
Major uses: Pasture and woodland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Hickory—loess over till; Kell—thin loess over glacial drift over material weathered from acid sandstone, siltstone, or shale

Runoff: Rapid
Available water capacity: Hickory—high; Kell—low
Seasonal high water table: At a depth of more than 6 feet
Organic matter content: Moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Hickory
Surface layer:
0 to 3 inches—dark brown silt loam

Subsurface layer:
3 to 11 inches—brown silt loam
11 to 16 inches—dark yellowish brown silt loam

Subsoil:
16 to 23 inches—strong brown loam
23 to 36 inches—strong brown clay loam
36 to 43 inches—yellowish brown clay loam
43 to 60 inches—yellowish brown loam

Kell
Surface layer:
0 to 3 inches—very dark grayish brown silt loam

Subsurface layer:
3 to 7 inches—mixed dark grayish brown and dark yellowish brown silt loam

Subsoil:
7 to 13 inches—yellowish brown loam
13 to 25 inches—yellowish brown silty clay loam
25 to 35 inches—mixed yellowish brown and light brownish gray very channery silty clay loam

Bedrock:
35 to 60 inches—mixed yellowish brown and light brownish gray, weathered bedrock

Composition

Hickory and Kell soils and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that are less sloping
- Soils that are more severely eroded

Contrasting inclusions:
- The somewhat poorly drained Blair soils at the head of drainageways and on the upper concave side slopes
- The somewhat poorly drained Belknap soils and the moderately well drained Sharon soils in narrow areas of bottom land adjacent to drainageways that dissect the steeper slopes

Use and Management

Cropland
Management measures or considerations:
- Because of the slope, these soils are unsuited to use as cropland.

Pasture
Management concerns: Slope, erosion, and tilth
Management measures or considerations:
- The slope limits the use of equipment and increases the hazard of erosion.
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The slope limits the use of equipment and increases the hazard of erosion.
- Placing logging roads and skid trails on or near the contour and skidding logs or trees uphill with a cable and winch help to overcome the slope.
- Seeding bare areas to grass or to a grass-legume mixture after logging activities reduces the hazard of erosion.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management measures or considerations:
- Because of the slope, these soils are unsuited to use as sites for dwellings.

Septic tank absorption fields
Management measures or considerations:
- Because of the slope, these soils are unsuited to use as sites for septic tank absorption fields.

Interpretive Groups

Land capability classification: 6e

Lenzburg Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Uplands
Position on the landform: Surface-mined areas
Parent material: Mine spoil
Slope range: 7 to 20 percent

Taxonomic classification: Fine-loamy, mixed, active, calcareous, mesic Haplic Udarents

Typical Pedon

Lenzburg gravelly silty clay loam, 20 to 60 percent slopes, 75 feet north and 925 feet east of the southwest corner of sec. 3, T. 4 S., R. 4 E., Jefferson County, Illinois:

A—0 to 4 inches; 90 percent brown (10YR 4/3) and 10 percent gray (2.5Y 5/1) gravelly silty clay loam; weak medium granular structure; firm; common fine roots throughout; neutral; 10 percent sedimentary pebbles; abrupt smooth boundary.

C1—4 to 20 inches; 60 percent brown 10YR 4/3), 20 percent light olive brown (2.5Y 5/6), and 20 percent gray (2.5Y 6/1) gravelly silty clay loam; massive; very firm; common fine roots throughout; common fine and medium rounded iron-manganese concretions; common fine and medium irregular soft masses of carbonate; slightly effervescent; slightly alkaline; 15 percent sedimentary pebbles; clear smooth boundary.

C2—20 to 43 inches; 34 percent light olive brown (2.5Y 5/6), 33 percent gray (2.5Y 6/1), and 33 percent yellowish brown (10YR 5/6) gravelly silty clay loam; common fine and medium prominent strong brown (7.5YR 4/6) mottles; massive or moderate medium prismatic structure; very firm; few fine roots throughout; common fine and medium rounded iron-manganese concretions; common fine and medium irregular soft masses of carbonate; very slightly effervescent; moderately alkaline; 25 percent sedimentary pebbles; 3 percent sedimentary channers; abrupt smooth boundary.

C3—43 to 60 inches; 90 percent gray (2.5Y 5/1) and 10 percent black (2.5Y 2.5/1) cobbly clay loam; many medium prominent yellowish brown (10YR 5/8) mottles; massive; extremely firm; few very fine roots throughout; common fine rounded iron-manganese concretions; slightly alkaline; 25 percent sedimentary cobbles; 5 percent coal channers.

Range in Characteristics

Depth to bedrock: More than 60 inches
Carbonates: Throughout the profile

A horizon:
Hue—10YR, 2.5Y, or 5Y
Value—2 to 5
Chroma—1 to 4
Texture—silt loam, silty clay loam, clay loam, loam, or the gravelly analogs of these textures

C horizon:
Hue—10YR, 2.5Y, or 7.5YR
Value—2 to 6
Chroma—1 to 6
Texture—silty clay, silty clay loam, silt loam, clay loam, loam, or the gravelly, channery, or cobbly analogs of these textures

871D—Lenzburg gravelly silty clay loam, 7 to 20 percent slopes

Setting

Landform: Uplands
Position on the landform: Surface-mined areas
Major use: Wildlife habitat

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately slow
Parent material: Mine spoil
Runoff: Medium or rapid
Available water capacity: Moderate or low
Seasonal high water table: At a depth of more than 6 feet
Organic matter content: Low to moderate
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 5 inches—mixed gray and brownish yellow gravelly silty clay loam

Substratum:
5 to 9 inches—gray channery silty clay loam
9 to 21 inches—mixed light brownish gray and brownish yellow silty clay loam
21 to 39 inches—mixed yellowish brown and light gray silty clay loam
39 to 60 inches—mixed light brownish gray, black, and dark gray channery clay

Composition

Lenzburg soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Well drained soils that contain more or fewer rock fragments than the Lenzburg soil
- Soils that are less sloping than the Lenzburg soil

Contrasting inclusions:
- Soils in small depressions that are subject to ponding and that formed as a result of differential settling

Use and Management

Cropland
Management concerns: Slope and erosion
- Because of the slope, the hazard of erosion, and droughtiness, this soil is unsuited to use as cropland.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: The shrink-swell potential and the slope
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Building on the contour or land shaping helps to overcome the slope.

Septic tank absorption fields
Management concerns: Restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 6s

Okaw Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Terraces
Position on the landform: Broad flats
Parent material: Loess over clayey lacustrine sediments
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Chromic Vertic Albaqualfs

Typical Pedon

Okaw silt loam, 0 to 2 percent slopes, 1,280 feet west and 554 feet south of the northeast corner of sec. 36, T. 7 S., R. 1 E., Franklin County, Illinois:

Ap1—0 to 4 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak medium granular structure; friable; few very fine and fine roots throughout; neutral; abrupt smooth boundary.

Ap2—4 to 8 inches; dark grayish brown (10YR 4/2) and light brownish gray (10YR 6/2) silty clay loam; weak medium subangular blocky structure; firm; few very fine and fine roots throughout; common fine irregular soft masses of iron-manganese; neutral; abrupt smooth boundary.

Eg—8 to 16 inches; light brownish gray (10YR 6/2) silty clay loam; weak medium subangular blocky structure; firm; few very fine and fine roots throughout; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

2Btg1—16 to 40 inches; gray (5Y 5/1) silty clay; moderate medium prismatic structure; very firm; few fine roots between peds and few very coarse roots throughout; few faint dark gray (5Y 4/1) discontinuous clay films on faces of peds and in pores; common fine and medium prominent red (2.5YR 5/8) and yellowish brown (10YR

5/6) masses of iron accumulation and common medium and coarse distinct dark bluish gray (5B 4/1) iron depletions in the matrix; common fine and medium irregular soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

2Btg2—40 to 54 inches; olive gray (5Y 5/2) silty clay; moderate medium prismatic structure parting to weak medium angular blocky; very firm; few fine roots between peds and few very coarse roots throughout; common faint weak red (2.5YR 4/2) and olive gray (5Y 5/2) discontinuous clay films on faces of peds and in pores; common fine prominent yellowish brown (10YR 5/6) masses of iron accumulation and common medium prominent dark bluish gray (5B 4/1) iron depletions in the matrix; common fine irregular soft masses of carbonate; many medium and coarse irregular soft masses of iron-manganese; slightly alkaline; gradual smooth boundary.

2Btg3—54 to 67 inches; olive gray (5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; few fine roots between peds; many faint dark grayish brown (2.5Y 4/2) and olive gray (5Y 5/2) continuous clay films on faces of peds and in pores; common fine distinct yellowish brown (10YR 5/4 and 5/6) masses of iron accumulation and common medium prominent dark bluish gray (5B 4/1) iron depletions in the matrix; common fine irregular soft masses of carbonate; many medium and coarse irregular soft masses of iron-manganese; moderately alkaline.

Range in Characteristics

Thickness of the loess: 8 to 20 inches
Depth to bedrock: More than 60 inches
Depth to carbonates: More than 40 inches

Ap horizon:
Hue—10YR
Value—3 to 5
Chroma—1 to 3
Texture—silt loam or silty clay loam

Eg horizon:
Hue—10YR
Value—4 to 7
Chroma—1 or 2
Texture—silt loam or silty clay loam

2Btg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—3 to 6
Chroma—0 to 2
Texture—silty clay or clay

84A—Okaw silt loam, 0 to 2 percent slopes

Setting

Landform: Terraces
Position on the landform: Broad flats
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow

Parent material: Loess over clayey lacustrine sediments
Runoff: Slow or very slow
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 4 inches—dark grayish brown silt loam
4 to 8 inches—mixed dark grayish brown and light brownish gray silty clay loam

Subsurface layer:
8 to 16 inches—light brownish gray silty clay loam

Subsoil:
16 to 40 inches—gray silty clay
40 to 67 inches—olive gray silty clay

Composition

Okaw soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that are better drained than the Okaw soil

Contrasting inclusions:
- The somewhat poorly drained Bluford soils on convex slopes and side slopes

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses improves tilth.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include canarygrass and switchgrass.

Forestland
Management measures or considerations:
- The use of machinery is limited to periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Ponding and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The ponding is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Ponding and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3w

802B—Orthents, loamy, undulating

Setting

Position on the landform: Uplands; modified by construction at work sites
Major uses: Cut and fill areas, borrow areas, and surface-mined areas

Soil Properties and Qualities

Drainage class: Poorly drained to well drained
Permeability: Moderately slow
Parent material: Mixed fill
Runoff: Medium or slow
Available water capacity: High
Seasonal high water table: 3.5 to 6.0 feet below the surface
Organic matter content: Low or moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Composition

Orthents and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent

Inclusions

Similar inclusions:
- Areas that are more sloping than the Orthents

- Small areas of natural soil
- Areas that have a high content of rock fragments, cinders, bricks, or other debris

Contrasting inclusions:
- Small areas where buildings, roads, railroads, parking lots, or storage facilities cover the surface

Interpretive Groups

Land capability classification: Not assigned

802F—Orthents, loamy, hilly and very hilly

Setting

Position on the landform: Uplands; modified by construction at work sites
Major uses: Cut and fill areas, borrow areas, and surface-mined areas

Soil Properties and Qualities

Drainage class: Somewhat poorly drained to well drained
Permeability: Moderately slow
Parent material: Mixed fill
Runoff: Very rapid or rapid
Available water capacity: High
Seasonal high water table: 3.5 to 6.0 feet below the surface
Organic matter content: Low or moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: Moderate

Composition

Orthents and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Areas that are less sloping than the Orthents
- Small areas of natural soil
- Areas that have a high content of rock fragments, cinders, bricks, or other debris

Contrasting inclusions:
- Small areas where bridges, roads, or railroads cover the surface

Interpretive Groups

Land capability classification: Not assigned

Parke Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Uplands
Position on the landform: Side slopes
Parent material: Loess over glacial outwash
Slope range: 10 to 18 percent

Taxonomic classification: Fine-silty, mixed, active, mesic Typic Hapludalfs
Taxadjunct features: The Parke soils in this survey area have a base saturation of more than 60 percent at a depth of 125 cm below the top of the argillic horizon.

Typical Pedon

Parke silty clay loam, 10 to 18 percent slopes, severely eroded, 620 feet north and 2,460 feet east of the southwest corner of sec. 16, T. 6 S., R. 2 E., Franklin County, Illinois:

Ap—0 to 5 inches; 40 percent brown (10YR 4/3), 20 percent brown (10YR 5/3), and 20 percent strong brown (7.5YR 4/6) silty clay loam; pale brown (10YR 6/3) dry; weak fine subangular blocky structure parting to weak very fine and fine granular; friable; common very fine and fine roots throughout; neutral; abrupt smooth boundary.

Ap/Bt—5 to 9 inches; 50 percent brown (10YR 4/3) and 50 percent strong brown (7.5YR 4/6) silty clay loam; moderate fine and medium subangular blocky structure; friable; common fine roots throughout; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds and in pores; neutral; abrupt smooth boundary.

2Bt1—9 to 17 inches; strong brown (7.5YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; few fine roots between peds; common distinct reddish brown (5YR 4/4) clay films on faces of peds and in pores; few fine irregular soft masses of iron-manganese; moderately acid; 1 percent sedimentary pebbles; clear smooth boundary.

2Bt2—17 to 30 inches; brown (7.5YR 5/4) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; firm; few fine roots between peds; common distinct reddish brown (5YR 4/3) clay films on faces of peds and in pores and few prominent pink (7.5YR 7/4) skeletans (sand or silt); few medium rounded soft masses of iron and few fine irregular soft masses of iron-manganese; moderately acid; 1 percent sedimentary pebbles; gradual smooth boundary.

3Btb1—30 to 50 inches; reddish brown (5YR 4/4) clay loam; weak medium prismatic structure; firm; few very fine roots between peds; few faint reddish brown (5YR 4/3) clay films on faces of peds and in pores and few prominent pink (7.5YR 7/4) skeletans (sand or silt); few medium rounded soft masses of iron, few fine irregular soft masses of iron-manganese, and few fine irregular barite crystals; slightly acid; 2 percent igneous pebbles; clear smooth boundary.

3Btb2—50 to 78 inches; 60 percent reddish brown (5YR 4/4) and 40 percent yellowish red (5YR 5/6) clay loam; weak fine and medium subangular blocky structure; friable; few faint reddish brown (5YR 4/4) clay films on faces of peds and in pores; common fine and medium irregular soft masses of iron-manganese, common fine irregular barite crystals, and few medium rounded soft masses of iron; slightly acid; 13 percent igneous pebbles and 1 percent sedimentary pebbles.

Range in Characteristics

Thickness of the loess: 20 to 40 inches
Depth to bedrock: More than 60 inches
Depth to carbonates: More than 60 inches

A or Ap horizon:
Hue—10YR or 7.5YR
Value—3 to 5
Chroma—1 to 6
Texture—silt loam or silty clay loam

Ap/Bt or Bt horizon:
Hue—10YR or 7.5YR

Value—4 or 5
Chroma—4 to 6
Texture—silt loam or silty clay loam

2Bt horizon:
Hue—10YR or 7.5YR
Value—3 to 5
Chroma—3 to 6
Texture—silt loam or silty clay loam

3Btb horizon:
Hue—2.5YR, 5YR, or 7.5YR
Value—3 to 5
Chroma—3 to 6
Texture—loam, clay loam, sandy loam, or sandy clay loam

15D3—Parke silty clay loam, 10 to 18 percent slopes, severely eroded

Setting

Landform: Uplands
Position on the landform: Side slopes
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial drift
Runoff: Rapid
Available water capacity: High
Seasonal high water table: At a depth of more than 6 feet
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—mixed brown and strong brown silty clay loam

Subsoil:
9 to 17 inches—strong brown silty clay loam
17 to 30 inches—brown silty clay loam
30 to 50 inches—reddish brown clay loam
50 to 78 inches—mixed reddish brown and yellowish red clay loam

Composition

Parke soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that are less red and more brittle than the Parke soil
- Soils that are less severely eroded than the Parke soil

- Soils that are less sloping than the Parke soil
- Soils that formed over bedrock

Contrasting inclusions:
- The somewhat poorly drained Creal soils at the head of drainageways and on concave side slopes

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: The shrink-swell potential and the slope
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Land shaping by cutting and filling helps to overcome the slope.

Septic tank absorption fields
Management concerns: Slope
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 4e

Pike Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Uplands
Position on the landform: Convex ridgetops and side slopes of interfluves
Parent material: Loess over glacial outwash
Slope range: 2 to 10 percent

Taxonomic classification: Fine-silty, mixed, active, mesic Typic Hapludalfs
Taxadjunct features: The Pike soils in this survey area have a base saturation of more than 60 percent at a depth of 125 cm below the top of the argillic horizon.

Typical Pedon

Pike silt loam, 2 to 5 percent slopes, 2,060 feet north and 700 feet east of the southwest corner of sec. 22, T. 5 S., R. 1 E., Franklin County, Illinois:

A—0 to 4 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; strong fine crumb structure; very friable; many very fine and fine roots throughout; neutral; clear smooth boundary.
E—4 to 8 inches; brown (10YR 4/3) and dark yellowish brown (10YR 4/4) silt loam; moderate fine subangular blocky structure; friable; many very fine roots throughout; neutral; clear smooth boundary.
Bt1—8 to 12 inches; strong brown (7.5YR 4/6) silty clay loam; moderate medium subangular blocky structure parting to moderate fine subangular blocky; firm; common very fine roots throughout; very few distinct brown (7.5YR 4/4) discontinuous clay films on faces of peds and in pores and few brown (10YR 4/3) patchy organic coats; slightly acid; clear smooth boundary.
Bt2—12 to 38 inches; strong brown (7.5YR 4/6) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; common very fine roots between peds; few distinct brown (7.5YR 4/4) discontinuous clay films on faces of peds and in pores; common fine rounded iron-manganese concretions; strongly acid; gradual smooth boundary.
2Bt3—38 to 57 inches; strong brown (7.5YR 4/6) silt loam; moderate coarse prismatic structure; firm; few very fine roots between peds; few distinct brown (7.5YR 4/4) discontinuous clay films on faces of peds and in pores; common fine rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.
3Btb—57 to 75 inches; yellowish red (5YR 4/6) clay loam; weak medium prismatic structure parting to weak medium subangular blocky; firm; few very fine roots between peds; few distinct pinkish gray (7.5YR 7/2) discontinuous skeletans (silt) throughout and very few brown (7.5YR 4/4) clay films on faces of peds and in pores; very strongly acid; 2 percent igneous pebbles; gradual smooth boundary.
3BCb—75 to 104 inches; yellowish red (5YR 4/6) clay loam; common fine distinct brown (7.5YR 4/4) mottles; massive; firm; very few distinct brown (7.5YR 4/4) discontinuous clay films in root channels and pores and few pinkish gray (7.5YR 7/2) patchy skeletans (silt) throughout; very strongly acid; 2 percent igneous pebbles; gradual smooth boundary.
3C—104 to 124 inches; red (2.5YR 4/6) clay loam; massive; firm; very strongly acid; 5 percent igneous pebbles; 2 percent sandstone pebbles.

Range in Characteristics

Thickness of the loess: 40 to 60 inches
Depth to bedrock: More than 60 inches
Depth to carbonates: More than 60 inches

A or Ap horizon:
Hue—10YR or 7.5YR
Value—3 to 5
Chroma—1 to 6
Texture—silt loam or silty clay loam

E horizon:
Hue—10YR or 7.5YR
Value—3 to 6
Chroma—4 to 6
Texture—silt loam or silty clay loam

Bt or 2Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—4 to 6
Texture—silt loam or silty clay loam

2C horizon (if it occurs):
Hue—2.5YR or 5YR
Value—3 to 5
Chroma—3 to 6
Texture—loam, clay loam, sandy loam, or sandy clay loam

3Btb horizon:
Hue—2.5YR, 5YR, or 7.5YR
Value—4 or 5
Chroma—4 to 6
Texture—loam, clay loam, sandy loam, or sandy clay loam

583B—Pike silt loam, 2 to 5 percent slopes

Setting

Landform: Uplands
Position on the landform: Convex ridgetops on interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial drift
Runoff: Slow
Available water capacity: High
Seasonal high water table: At a depth of more than 6 feet
Organic matter content: Low or moderately low
Erosion hazard: Moderate
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 4 inches—brown silt loam

Subsurface layer:
4 to 8 inches—mixed brown and dark yellowish brown silt loam

Subsoil:
8 to 38 inches—strong brown silty clay loam
38 to 57 inches—strong brown silt loam
57 to 75 inches—yellowish red clay loam

Composition

Pike soil and similar inclusions: 100 percent

Inclusions

Similar inclusions:
- Soils that are less red and more brittle than the Pike soil
- Soils that are more severely eroded than the Pike soil
- Soils that are more sloping than the Pike soil
- Soils that formed over bedrock

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management measures or considerations:
- This soil has only slight limitations affecting its use as a site for dwellings. Onsite investigation is needed.

Septic tank absorption fields
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

583C2—Pike silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Uplands
Position on the landform: Convex ridgetops and side slopes of interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess over glacial drift
Runoff: Medium
Available water capacity: High
Seasonal high water table: At a depth of more than 6 feet
Organic matter content: Low or moderately low
Erosion hazard: Severe
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—brown silt loam

Subsoil:
6 to 28 inches—dark yellowish brown and yellowish brown silty clay loam
28 to 41 inches—strong brown and reddish yellow silt loam
41 to 78 inches—yellowish red clay loam

Composition

Pike soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that are less red and more brittle than the Pike soil
- Soils that are more severely eroded than the Pike soil
- Soils that are more sloping than the Pike soil
- Soils that formed over bedrock

Contrasting inclusions:
- The somewhat poorly drained Creal soils at the head of drainageways and on concave side slopes

Use and Management

Cropland

Management concerns: Erosion and tilth

Management measures or considerations:

- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Management concerns: Erosion and tilth

Management measures or considerations:

- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland

Management measures or considerations:

- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:

- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management measures or considerations:

- This soil has only slight limitations affecting its use as a site for dwellings. Onsite investigation is needed.

Septic tank absorption fields

Management measures or considerations:

- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3e

Plumfield Series

Depth class: Shallow or very shallow over a fragipan
Drainage class: Moderately well drained
Permeability: Very slow
Landform: Uplands
Position on the landform: Side slopes
Parent material: Thin loess over glacial drift
Slope range: 5 to 18 percent

Taxonomic classification: Fine-silty, mixed, active, mesic Aquic Fragiudalfs

Typical Pedon

Plumfield silty clay loam, 5 to 10 percent slopes, 500 feet east and 2,060 feet south of the northwest corner of sec. 18, T. 7 S., R. 2 E., Franklin County, Illinois:

Ap—0 to 5 inches; yellowish brown (10YR 5/4) silty clay loam, light yellowish brown (10YR 6/4) dry; weak fine granular structure; friable; common very fine and fine roots throughout; very strongly acid; abrupt smooth boundary.

Btx1—5 to 7 inches; yellowish brown (10YR 5/6) silty clay loam; strong thick platy structure parting to strong medium platy; very firm, brittle; few very fine roots between peds; few faint dark yellowish brown (10YR 4/6) clay films on faces of peds and in pores; common fine rounded soft masses of iron-manganese; extremely acid; abrupt smooth boundary.

2Btx2—7 to 12 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; very firm, brittle; few very fine roots between peds; common faint grayish brown (10YR 5/2) and brown (10YR 5/3) clay films on faces of peds and in pores; few prominent white (10YR 8/1) skeletans (silt) on faces of peds and in pores; common fine and medium prominent grayish brown (10YR 5/2) iron depletions in the matrix; common fine rounded soft masses of iron-manganese; extremely acid; clear smooth boundary.

2Btx3—12 to 36 inches; yellowish brown (10YR 5/6) silt loam; weak coarse and very coarse prismatic structure; very firm, brittle; few very fine roots between peds; few faint dark yellowish brown (10YR 4/6) clay films on faces of peds and in pores; common fine prominent grayish brown (10YR 5/2) iron depletions in the matrix; common fine rounded soft masses of iron-manganese; very strongly acid; 1 percent pebbles (igneous); gradual smooth boundary.

3Btg1—36 to 46 inches; grayish brown (10YR 5/2) silty clay loam; moderate coarse and medium prismatic structure parting to moderate medium angular blocky; very firm; few distinct dark yellowish brown (10YR 4/6) and few faint brown (10YR 5/3) and gray (10YR 5/1) clay films on faces of peds and in pores; many fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine irregular soft masses of iron-manganese and common fine irregular barite crystals; 1 percent gravel; strongly acid; gradual smooth boundary.

3Btg2—46 to 56 inches; grayish brown (10YR 5/2) silty clay loam; weak coarse prismatic structure; very firm; few distinct dark yellowish brown (10YR 4/6) and few faint brown (10YR 5/3) and gray (10YR 5/1) clay films on faces of peds and in pores; many fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine irregular soft masses of iron-manganese and common fine irregular barite crystals; 1 percent gravel; moderately acid; gradual smooth boundary.

3Btg3—56 to 70 inches; grayish brown (10YR 5/2) silty clay loam; weak very coarse prismatic structure; very firm; common faint gray (10YR 5/1) and brown (10YR 5/3) clay films on faces of peds and in pores and few distinct dark yellowish brown (10YR 4/6) clay films on faces of peds and in pores; many fine and medium prominent yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; many fine and medium irregular soft masses of iron-manganese and common fine irregular barite crystals; 1 percent gravel; slightly acid.

Range in Characteristics

Thickness of the loess: 0 to 20 inches
Depth to bedrock: More than 60 inches
Depth to the fragipan: 5 to 20 inches

Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 to 4
Texture—silty clay loam

Btx horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam or silty clay loam

2Btx horizon:
Hue—10YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam, silty clay loam, or loam

3Btg horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—1 or 2
Texture—loam, silt loam, clay loam, or silty clay loam

10C—Plumfield silty clay loam, 5 to 10 percent slopes

Setting

Landform: Uplands
Position on the landform: Side slopes
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Thin loess over glacial drift
Runoff: Rapid
Available water capacity: Low
Seasonal high water table: Perched at a depth of 1.5 to 3.5 feet
Organic matter content: Very low or low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown silty clay loam

Subsoil:
5 to 7 inches—yellowish brown, brittle silty clay loam
7 to 21 inches—yellowish brown, brittle silty clay loam
21 to 36 inches—yellowish brown, brittle silt loam
36 to 70 inches—grayish brown silty clay loam

Composition

Plumfield soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that are less brittle than the Plumfield soil
- Soils that are less sloping than the Plumfield soil
- Soils that have thicker loess than the Plumfield soil

Contrasting inclusions:
- The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes
- The somewhat poorly drained Belknap soils, which are subject to frequent flooding; in narrow, long areas of bottom land in drainageways

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness
Management measures or considerations:
- Onsite investigation is needed.
- Installing subsurface drains around the foundations lowers the water table.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 4e

10D—Plumfield silty clay loam, 10 to 18 percent slopes

Setting

Landform: Uplands
Position on the landform: Side slopes
Major uses: Cultivated crops and pasture

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Thin loess over glacial drift
Runoff: Rapid
Available water capacity: Low
Seasonal high water table: Perched at a depth of 1.5 to 3.5 feet
Organic matter content: Very low or low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 6 inches—dark brown silty clay loam

Subsoil:
6 to 44 inches—yellowish brown, brittle silt loam
44 to 60 inches—yellowish brown clay loam

Composition

Plumfield soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that are less brittle than the Plumfield soil
- Soils that are less sloping than the Plumfield soil
- Soils that have thicker loess than the Plumfield soil

Contrasting inclusions:
- The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes
- The somewhat poorly drained Belknap soils, which are subject to frequent flooding; in narrow, long areas of bottom land in drainageways

Use and Management

Cropland
Management measures or considerations:
- Because of the erosion hazard and the shallow depth to a fragipan, this soil is generally unsuited to use as cropland.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the slope
Management measures or considerations:
- Onsite investigation is needed.
- Installing subsurface drains around the foundations lowers the water table.
- Land shaping by cutting and filling helps to overcome the slope.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 6e

Racoon Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landform: Uplands and benches
Position on the landform: Footslopes and shallow closed depressions
Parent material: Loess over depositional sediments
Slope range: 0 to 2 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Typic Endoaqualfs

Typical Pedon

Racoon silt loam, 0 to 2 percent slopes, 1,460 feet east and 120 feet south of the northwest corner of sec. 3, T. 5 S., R. 3 E., Franklin County, Illinois:

Ap—0 to 7 inches; 50 percent brown (10YR 4/3) and 50 percent grayish brown (10YR 5/2) silt loam; weak fine granular structure; friable; many fine and medium roots throughout; common fine irregular soft masses of iron-manganese; slightly alkaline; abrupt smooth boundary.

AE—7 to 10 inches; 30 percent brown (10YR 4/3) and 70 percent grayish brown (10YR 5/2) silt loam; moderate thin platy structure; friable; many fine and medium roots throughout; common fine irregular soft masses of iron-manganese; neutral; abrupt smooth boundary.

Eg1—10 to 16 inches; grayish brown (10YR 5/2) silt loam; weak thin platy structure; friable; many very fine and fine roots throughout; common coarse distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common fine and medium irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Eg2—16 to 29 inches; gray (10YR 6/1) silt loam; weak medium subangular blocky structure; friable; common fine roots throughout; common coarse prominent dark yellowish brown (10YR 4/6) and common coarse distinct yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; common fine and medium irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Btg1—29 to 41 inches; light brownish gray (10YR 6/2) silty clay loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few very fine roots between peds; very few faint brown (10YR 5/3) patchy clay films on faces of peds and in pores; common coarse prominent brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; common fine and medium irregular soft masses of iron-manganese; very strongly acid; clear smooth boundary.

Btg2—41 to 51 inches; gray (10YR 5/1) silty clay loam; weak medium subangular blocky structure; firm; few very fine roots between peds; few faint grayish brown (10YR 5/2) and few brown (10YR 4/3) discontinuous clay films on faces of peds and in pores; common medium prominent strong brown (7.5YR 4/6) and dark brown (7.5YR 3/4) masses of iron accumulation in the matrix; common fine irregular soft masses of iron-manganese and common fine irregular barite crystals; very strongly acid; clear smooth boundary.

2Btg3—51 to 60 inches; gray (10YR 5/1) silt loam; weak medium subangular blocky structure; firm; few very fine roots between peds; few faint grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; many medium prominent strong brown (7.5YR 4/6) masses of iron accumulation and common medium faint light gray (10YR 7/1) iron depletions in the matrix; common fine irregular soft masses of iron-manganese and common fine irregular barite crystals; very strongly acid.

Range in Characteristics

Thickness of the loess: 50 to 60 inches
Depth to bedrock: More than 60 inches
Depth to carbonates: More than 60 inches

Ap or A horizon:
Hue—10YR
Value—3 to 6
Chroma—2 or 3
Texture—silt loam

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 7
Chroma—1 or 2
Texture—silt loam

Btg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—5 to 7
Chroma—0 to 2
Texture—silty clay loam or silt loam

2Btg horizon:
Hue—10YR, 2.5Y, 5Y, or N
Value—5 to 7
Chroma—0 to 2
Texture—silt loam or silty clay loam

109A—Racoon silt loam, 0 to 2 percent slopes

Setting

Landform: Uplands and benches
Position on the landform: Footslopes and shallow closed depressions
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Slow
Parent material: Loess over depositional sediments
Runoff: Slow
Available water capacity: High
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: Moderately low
Erosion hazard: None or slight
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 10 inches—mixed brown and grayish brown silt loam

Subsurface layer:
10 to 16 inches—grayish brown silt loam
16 to 29 inches—gray silt loam

Subsoil:
29 to 41 inches—light brownish gray silty clay loam
41 to 51 inches—gray silty clay loam
51 to 60 inches—gray silt loam

Composition

Racoon soil and similar inclusions: 100 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Racoon soil
- Soils that are less than 24 inches deep over a claypan
- Soils that have a seasonal high water table at a depth of more than 1 foot
- Soils that are subject to frequent flooding

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The use of machinery is limited to periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Ponding
Management measures or considerations:
- Onsite investigation is needed.
- Installing subsurface drains around the foundations lowers the water table. The ponding is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Ponding and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3w

Rend Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Very slow
Landform: Benches
Position on the landform: Ridgetops and side slopes
Parent material: Loess over glacial drift (outwash, ablation till)
Slope range: 2 to 10 percent

Taxonomic classification: Fine-silty, mixed, active, mesic Fragic Oxyaquic Hapludalfs

Typical Pedon

Rend silt loam, 5 to 10 percent slopes, eroded, 710 feet south and 320 feet west of the northeast corner of sec. 14, T. 5 S., R. 2 E., Franklin County, Illinois:

Ap—0 to 5 inches; brown 10YR 4/3) silt loam, pale brown (10YR 6/3) dry; weak fine angular blocky structure parting to weak fine granular; friable; many fine roots throughout; few fine rounded iron-manganese concretions; slightly acid; abrupt smooth boundary.

Bt1—5 to 15 inches; yellowish brown (10YR 5/6) silty clay loam; moderate fine prismatic structure parting to strong fine subangular blocky; firm; common fine roots between peds; common distinct dark yellowish brown (10YR 4/6) discontinuous clay films on faces of peds and in pores; few fine rounded iron-manganese concretions; very strongly acid; abrupt smooth boundary.

Bt2—15 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; strong medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine and fine roots between peds; many distinct brown (10YR 4/3) discontinuous clay films on faces of peds and in pores; common medium distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; few fine rounded iron-manganese concretions; very strongly acid; abrupt smooth boundary.

2Btx1—24 to 40 inches; yellowish brown (10YR 5/6) silt loam; weak coarse prismatic structure; firm, brittle; few very fine roots between peds; few prominent gray (10YR 6/1) patchy skeletans (silt) on faces of peds and in pores; few distinct dark yellowish brown (10YR 4/4) discontinuous clay films on faces of peds and in pores; common medium distinct yellowish brown (10YR 5/4) masses of iron accumulation and common fine and medium prominent light brownish gray (10YR 6/2) iron depletions in the matrix; few fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

2Btx2—40 to 50 inches; yellowish brown (10YR 5/4) silt loam; weak coarse prismatic structure; firm, brittle; few very fine roots between peds; few prominent gray (10YR 6/1) patchy skeletans (silt) on faces of peds and in pores; few distinct dark yellowish brown (10YR 4/4) discontinuous clay films on faces of peds and in pores; common medium distinct yellowish brown (10YR 5/4) masses of iron accumulation and common fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; common fine rounded iron-manganese concretions; strongly acid; clear smooth boundary.

2Btx3—50 to 60 inches; yellowish brown (10YR 5/4) silt loam; moderate coarse prismatic structure; firm, brittle; few distinct dark yellowish brown (10YR 4/4) discontinuous clay films on faces of peds and in pores; many fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few

prominent black (2.5Y 2/0) patchy manganese or iron-manganese stains; common fine and medium rounded iron-manganese concretions; slightly acid.

Range in Characteristics

Thickness of the loess: 16 to 40 inches
Depth to bedrock: More than 60 inches

A or Ap horizon:
Hue—10YR
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silty clay loam

E horizon (if it occurs):
Hue—10YR
Value—4 or 5
Chroma—3 to 6
Texture—silt loam

Bt horizon:
Hue—7.5YR or 10YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

B/E horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 to 8
Chroma—1 to 6
Texture—silty clay loam or silt loam

B´t horizon (if it occurs):
Hue—10YR or 7.5YR
Value—3 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Btx horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—2 to 8
Texture—silt loam, silty clay loam, loam, or clay loam

518B—Rend silt loam, 2 to 5 percent slopes

Setting

Landform: Benches
Position on the landform: Convex ridgetops on interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Loess over glacial drift (outwash, ablation till)
Runoff: Medium
Available water capacity: Moderate or high

Seasonal high water table: 2.0 to 3.5 feet below the surface
Organic matter content: Low or moderately low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 8 inches—yellowish brown silt loam

Subsurface layer:
8 to 11 inches—yellowish brown silt loam

Subsoil:
11 to 13 inches—mixed white and yellowish brown silt loam
13 to 23 inches—brown silty clay loam
23 to 33 inches—mixed yellowish brown and brown silty clay loam
33 to 39 inches—mixed yellowish brown and brown, brittle silt loam
39 to 77 inches—mixed yellowish brown and brown, brittle silty clay loam
77 to 83 inches—mixed light brownish gray and yellowish brown loam

Composition

Rend soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that are redder and less brittle than the Rend soil
- Soils that are more severely eroded than the Rend soil
- Soils that are more sloping than the Rend soil
- Soils that formed in glacial drift

Contrasting inclusions:
- The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland

Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

518B2—Rend silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Benches
Position on the landform: Side slopes of interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Loess over glacial drift (ablation till, outwash)
Runoff: Medium
Available water capacity: Moderate or high
Seasonal high water table: 2.0 to 3.5 feet below the surface
Organic matter content: Low or moderately low
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown silt loam

Subsoil:
7 to 11 inches—pale brown silty clay loam
11 to 44 inches—mixed yellowish brown and light brownish gray silty clay loam
44 to 60 inches—grayish brown silt loam

Composition

Rend soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Rend soil
- Soils that are more sloping than the Rend soil and are more severely eroded
- Soils that have a seasonal high water table within a depth of 3 feet

Contrasting inclusions:
- The poorly drained Bonnie soils on narrow flood plains
- The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes
- The somewhat poorly drained Hurst soils in the adjacent less sloping areas

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential

Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

518C2—Rend silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Benches
Position on the landform: Side slopes of interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Very slow
Parent material: Loess over glacial drift (outwash, ablation till)
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 2.0 to 3.5 feet below the surface
Organic matter content: Low or moderately low
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 5 inches—brown silt loam

Subsoil:
5 to 15 inches—yellowish brown silty clay loam
15 to 24 inches—yellowish brown silty clay loam
24 to 60 inches—yellowish brown, brittle silt loam

Composition

Rend soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that are brittle at a depth of less than 24 inches
- Soils that are more severely eroded than the Rend soil

- Soils that are less sloping than the Rend soil
- Soils that formed in glacial drift

Contrasting inclusions:
- The poorly drained Bonnie soils on narrow flood plains
- The somewhat poorly drained Bluford soils at the head of drainageways and on concave side slopes
- The somewhat poorly drained Hurst soils in the adjacent less sloping areas

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3e

Richview Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform: Uplands
Position on the landform: Side slopes and summits of interfluves
Parent material: Loess over glacial drift
Slope range: 2 to 10 percent

Taxonomic classification: Fine-silty, mixed, superactive, mesic Mollic Oxyaquic Hapludalfs

Typical Pedon

Richview silt loam, 2 to 5 percent slopes, eroded, 1,200 feet west and 400 feet north of the southeast corner of sec. 21, T. 5 S., R. 3 E., Franklin County, Illinois:

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure; friable; many very fine and fine roots throughout; neutral; abrupt smooth boundary.

BE—9 to 11 inches; strong brown (7.5YR 5/6) silty clay loam; moderate fine subangular blocky structure parting to moderate very fine subangular blocky; friable; common very fine and fine roots throughout; common faint very dark grayish brown (10YR 3/2) discontinuous organic coats on faces of peds and in pores; many fine distinct yellowish red (5YR 5/8) masses of iron accumulation in the matrix; neutral; clear smooth boundary.

Bt1—11 to 19 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium subangular blocky structure; firm; few very fine and fine roots between peds; common faint yellowish brown (10YR 5/4) discontinuous clay films on faces of peds and in pores and few distinct very dark grayish brown (10YR 3/2) organic coats on faces of peds; many fine and medium prominent red (2.5YR 5/8) and common fine distinct strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; very strongly acid; clear smooth boundary.

Bt2—19 to 22 inches; brown (10YR 5/3) silty clay loam; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots between peds; common faint grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; very few prominent white (10YR 8/1) skeletans (silt) on faces of peds; few distinct very dark grayish brown (10YR 3/2) organic coats on faces of peds; many fine and medium prominent red (2.5YR 5/8) and common fine prominent strong brown (7.5YR 5/6) masses of iron accumulation in the matrix; very strongly acid; clear smooth boundary.

2Bt3—22 to 31 inches; yellowish brown (10YR 5/4) silt loam; moderate medium prismatic structure parting to weak medium and coarse angular blocky; firm; few very fine roots between peds; few faint grayish brown (10YR 5/2) discontinuous clay films on faces of peds and in pores; common distinct very dark gray (10YR 3/1) continuous organic coats on faces of peds; common fine and medium prominent red (2.5YR 5/8) masses of iron accumulation and common medium faint brown (10YR 5/3) iron depletions in the matrix; few fine rounded barite crystals; extremely acid; clear smooth boundary.

2Bt4—31 to 39 inches; yellowish brown (10YR 5/4) silt loam; weak coarse prismatic structure; very firm, brittle; few very fine roots between peds; common distinct very dark grayish brown (10YR 3/2) continuous organic coats on faces of peds and in pores and few faint grayish brown (10YR 5/2) discontinuous clay films; common fine faint brown (10YR 5/3) iron depletions in the matrix; few fine rounded barite crystals; very strongly acid; gradual smooth boundary.

2BC—39 to 50 inches; dark yellowish brown (10YR 4/4) silt loam; weak coarse prismatic structure; very firm, brittle; common fine and medium distinct yellowish brown (10YR 5/6) masses of iron accumulation in the matrix; few fine rounded barite crystals and few fine rounded soft masses of iron-manganese; very strongly acid; gradual smooth boundary.

2CB—50 to 70 inches; yellowish brown (10YR 5/6) silt loam; weak coarse prismatic structure; very firm, brittle; common medium and coarse distinct brown (10YR 5/3) iron depletions in the matrix; few fine rounded soft masses of iron-manganese; strongly acid.

Range in Characteristics

Thickness of the loess: 30 to 50 inches
Depth to bedrock: More than 60 inches

Ap or A horizon:
Hue—10YR
Value—2 or 3
Chroma—1 to 3
Texture—silt loam

BE horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 6
Texture—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam or silt loam

2Bt horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam, loam, or clay loam

2BC horizon:
Hue—10YR
Value—4 to 6
Chroma—3 to 6
Texture—silt loam, loam, or clay loam

2C horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—loam, clay loam, or silt loam

4B2—Richview silt loam, 2 to 5 percent slopes, eroded

Setting

Landform: Uplands
Position on the landform: Side slopes and summits of interfluves
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess over glacial drift
Runoff: Medium
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: Moderate
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—very dark grayish brown silt loam

Subsoil:
9 to 11 inches—strong brown silty clay loam
11 to 19 inches—yellowish brown silty clay loam
19 to 22 inches—brown silty clay loam
22 to 31 inches—yellowish brown silt loam
31 to 39 inches—yellowish brown, brittle silt loam
39 to 50 inches—dark yellowish brown, brittle silt loam

Substratum:
50 to 70 inches—yellowish brown, brittle silt loam

Composition

Richview soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that are more sloping than the Richview soil
- Soils that have a lighter colored surface layer than that of the Richview soil
- Soils that have a seasonal high water table within a depth of 4 feet

Contrasting inclusions:
- The poorly drained Chauncey soils along footslopes and at the head of drainageways
- The moderately well drained Ava soils in positions on the landform similar to those of the Richview soil

Use and Management

Cropland
Management concerns: Erosion and tilth

Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland
Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: The shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

4C2—Richview silt loam, 5 to 10 percent slopes, eroded

Setting

Landform: Uplands
Position on the landform: Side slopes
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Moderately well drained

Permeability: Moderate
Parent material: Loess over glacial drift
Runoff: Medium
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: Moderately low or moderate
Erosion hazard: Severe
Shrink-swell potential: Moderate
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—dark brown silt loam

Subsoil:
9 to 15 inches—strong brown silty clay loam
15 to 26 inches—yellowish brown silty clay loam
26 to 36 inches—brown silt loam
36 to 57 inches—yellowish brown silty clay loam
57 to 78 inches—mixed yellowish brown and light brownish gray silt loam

Composition

Richview soil and similar inclusions: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Inclusions

Similar inclusions:
- Soils that are less sloping than the Richview soil
- Soils that have a lighter colored surface layer than that of the Richview soil
- Soils that have a seasonal high water table within a depth of 4 feet

Contrasting inclusions:
- The poorly drained Chauncey soils along footslopes and at the head of drainageways
- The moderately well drained Ava soils in positions on the landform similar to those of the Richview soil

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland

Management measures or considerations:
- This soil has only slight limitations affecting its use as forestland.
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: The shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3e

Schuline Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Slow
Landform: Uplands
Position on the landform: Reclaimed surface-mined areas
Parent material: Mine spoil
Slope range: 1 to 5 percent

Taxonomic classification: Fine-loamy, mixed, active, calcareous, mesic Alfic Udarents

Typical Pedon

Schuline silt loam, 2 to 5 percent slopes, 500 feet east and 1,900 feet north of the southwest corner of sec. 25, T. 3 S., R. 4 E., Jefferson County, Illinois:

Ap—0 to 3 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine granular structure; friable; common fine and medium roots throughout; strongly effervescent; moderately alkaline; 5 percent sedimentary pebbles; abrupt smooth boundary.

AC—3 to 15 inches; dark grayish brown (10YR 4/2) and very dark gray (10YR 3/1) silty clay loam; massive; firm; common fine and medium roots throughout; slightly effervescent; slightly alkaline; 10 percent sedimentary channers; 3 percent coal channers; clear wavy boundary.

C1—15 to 24 inches; 50 percent brown (10YR 5/3), 30 percent black (2.5Y 2.5/1), and 20 percent yellowish brown (10YR 5/8) channery silty clay loam; massive; firm; common fine roots in cracks; slightly effervescent; slightly alkaline; 30 percent igneous channers; abrupt wavy boundary.

C2—24 to 31 inches; 70 percent dark yellowish brown (10YR 4/6) and 30 percent gray (10YR 5/1) silty clay loam; massive; firm; common very fine roots in cracks; common medium irregular iron-manganese concretions; slightly effervescent; slightly alkaline; 10 percent sedimentary pebbles; abrupt wavy boundary.

C3—31 to 52 inches; very dark gray (10YR 3/1), dark yellowish brown (10YR 4/4), gray (2.5Y 5/1), and very pale brown (10YR 7/4) channery silty clay loam; massive; firm; common very fine roots in cracks; slightly effervescent; slightly alkaline; 30 percent sedimentary channers; 3 percent coal channers; abrupt wavy boundary.

C4—52 to 69 inches; brown (10YR 5/3), black (2.5Y 2.5/1), gray (2.5Y 5/1), and grayish green (5G 4/2) channery clay loam; massive; very firm; common very fine roots in cracks; common fine and medium rounded soft masses of carbonate; strongly effervescent; moderately alkaline; 15 percent sedimentary channers.

Range in Characteristics

Depth to bedrock: More than 60 inches
Carbonates: Throughout the profile

Ap horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—1 to 6
Texture—silt loam, silty clay loam, clay loam, or loam

C horizon (to a depth of 48 inches):
Hue—10YR or 7.5YR
Value—2 to 7 (dominantly 4 to 7)
Chroma—1 to 6
Texture—silt loam, silty clay loam, clay loam, or loam

C horizon (below a depth of 48 inches):
Color—mixed
Texture—silt loam, silty clay loam, clay loam, loam, silty clay, or the gravelly or channery analogs of these textures

823B—Schuline silt loam, 1 to 5 percent slopes

Setting

Landform: Uplands
Position on the landform: Reclaimed surface-mined areas
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Slow
Parent material: Mine spoil
Runoff: Medium
Available water capacity: High
Seasonal high water table: At a depth of more than 6 feet
Organic matter content: Low or moderately low
Erosion hazard: Moderate

Shrink-swell potential: Moderate
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 3 inches—dark grayish brown silt loam
3 to 15 inches—mixed dark grayish brown and very dark gray silty clay loam

Substratum:
15 to 24 inches—mixed brown, black, and yellowish brown channery silty clay loam
24 to 31 inches—mixed dark yellowish brown and gray silty clay loam
31 to 52 inches—mixed very dark gray, dark yellowish brown, gray, and very pale brown channery silty clay loam
52 to 60 inches—mixed brown, black, gray, and grayish green channery clay loam

Composition

Schuline soil and similar inclusions: 90 to 100 percent
Contrasting inclusions: 0 to 10 percent

Inclusions

Similar inclusions:
- Well drained soils that contain more rock fragments than the Schuline soil
- Soils that are more sloping than the Schuline soil
- Areas of Orthents

Contrasting inclusions:
- Soils in small depressions that are subject to ponding and that formed as a result of differential settling (fig. 5)

Use and Management

Cropland
Management concerns: Erosion and tilth
Management measures or considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, and contour farming help to control erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Figure 5.—Ponding of surface water in a small depression or sink formed by differential settling in a surface-mined area.

Dwellings

Management concerns: The shrink-swell potential

Management measures or considerations:

- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Management concerns: Restricted permeability

Management measures or considerations:

- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 2e

Sharon Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform: Flood plains
Position on the landform: Natural levees along stream channels and slight rises on broad flood plains

Parent material: Silty alluvium
Slope range: 0 to 2 percent

Taxonomic classification: Coarse-silty, mixed, active, acid, mesic Oxyaquic Udifluvents

Typical Pedon

Sharon silt loam, 0 to 2 percent slopes, frequently flooded, 1,800 feet west and 140 feet south of the northeast corner of sec. 25, T. 7 S., R. 4 E., Franklin County, Illinois:

Ap—0 to 3 inches; 60 percent brown (10YR 4/3) and 40 percent dark brown (10YR 3/3) silt loam, light brownish gray (10YR 6/2) dry; strong fine and medium granular structure; friable; common fine and medium roots throughout; slightly acid; abrupt smooth boundary.

A1—3 to 9 inches; 60 percent brown (10YR 4/3) and 40 percent dark brown (10YR 3/3) silt loam, light brownish gray (10YR 6/2) dry; strong medium granular structure; friable; common fine and medium roots throughout; strongly acid; abrupt smooth boundary.

A2—9 to 13 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; strong fine granular structure; friable; common fine and medium roots throughout; moderately acid; clear smooth boundary.

CA—13 to 17 inches; 60 percent yellowish brown (10YR 5/6) and 40 percent brown (10YR 4/3) silt loam; massive; friable; few fine roots throughout; strongly acid; clear smooth boundary.

C1—17 to 23 inches; yellowish brown (10YR 5/6) silt loam; massive; friable; few fine roots throughout; very strongly acid; clear smooth boundary.

C2—23 to 29 inches; yellowish brown (10YR 5/4) silt loam; massive; friable; strongly acid; clear smooth boundary.

C3—29 to 40 inches; yellowish brown (10YR 5/4) silt loam; massive; friable; very few faint brown (10YR 4/3) discontinuous organic coats in root channels and pores; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine rounded soft masses of iron-manganese; strongly acid; clear smooth boundary.

C4—40 to 60 inches; yellowish brown (10YR 5/4) silt loam; massive; friable; few faint very dark grayish brown (10YR 3/2) discontinuous organic coats in root channels and pores; common fine distinct grayish brown (10YR 5/2) iron depletions in the matrix; few fine rounded soft masses of iron-manganese; moderately acid.

Range in Characteristics

Depth to bedrock: More than 60 inches

Ap or A horizon:
Hue—10YR
Value—3 to 5
Chroma—2 to 4
Texture—silt loam

C horizon:
Hue—10YR or 7.5YR
Value—4 to 7
Chroma—2 to 6
Texture—silt loam or silt

3072A—Sharon silt loam, 0 to 2 percent slopes, frequently flooded

Setting

Landform: Flood plains
Position on the landform: Natural levees along stream channels and slight rises on broad flood plains
Flooding frequency: Frequent
Flooding duration: Brief
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: High
Seasonal high water table: 3 to 6 feet below the surface
Organic matter content: Low or moderately low
Erosion hazard: None or slight
Shrink-swell potential: Low
Potential for frost action: High

Typical Profile

Surface layer:
0 to 9 inches—mixed brown and dark brown silt loam
9 to 13 inches—very dark grayish brown silt loam

Substratum:
13 to 17 inches—mixed yellowish brown and brown silt loam
17 to 29 inches—yellowish brown silt loam
29 to 60 inches—yellowish brown silt loam

Composition

Sharon soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Sharon soil
- Soils that have a seasonal high water table at a depth of less than 1 foot; in the lower areas

Contrasting inclusions:
- The very poorly drained Bonnie soils in shallow closed depressions

Use and Management

Cropland
Management concerns: Flooding and tilth
Management measures or considerations:
- A well maintained surface drainage system helps to protect the soil from flooding during the growing season.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.

- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Flooding and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wildlife seedings, shrubs, and trees.

Dwellings
Management measures or considerations:
- Because of the flooding and wetness, this soil is unsuited to use as a site for dwellings.

Septic tank absorption fields
Management measures or considerations:
- Because of the flooding and wetness, this soil is unsuited to use as a site for septic tank absorption fields.

Interpretive Groups

Land capability classification: 2w

533—Urban land

Setting

Position on the landform: Upland bench and terrace positions that have been modified by urban development activities
Shape of areas: Rectangular
Major uses: Urban development

Properties and Qualities

- This map unit consists of areas that generally are covered by buildings higher than two stories, shopping centers, and parking lots. Because of extensive land smoothing, areas of this unit generally are nearly level or gently sloping.

Composition

Urban land and similar inclusions: 100 percent

Inclusions

Similar inclusions:
- Small areas of silty Orthents that have been disturbed as a result of urban development

Use and Management

- Vegetation in this map unit is confined to large planter boxes and areas where topsoil was brought in. Periodic supplemental watering is needed in these areas to sustain trees, shrubs, and grasses.

Interpretive Groups

Land capability classification: Not assigned

Wynoose Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Uplands and benches
Position on the landform: Broad flats and depressions on divides
Parent material: Loess over glacial drift
Slope range: 0 to 2 percent

Taxonomic classification: Fine, smectitic, mesic Typic Albaqualfs

Typical Pedon

Wynoose silt loam, 0 to 2 percent slopes, 2,040 feet west and 1,000 feet south of the northeast corner of sec. 26, T. 4 S., R. 1 E., Franklin County, Illinois:

Ap—0 to 7 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; weak very fine and fine granular structure; firm; many fine roots throughout; slightly alkaline; abrupt smooth boundary.

Eg—7 to 11 inches; light gray (10YR 7/1) silt loam; moderate medium platy structure parting to moderate thick platy; friable; many fine roots throughout; common fine prominent dark yellowish brown (10YR 4/6) masses of iron accumulation in the matrix; neutral; abrupt smooth boundary.

B/Eg—11 to 14 inches; 60 percent light gray (10YR 7/1) (exterior) silty clay loam (E) and light brownish gray (10YR 6/2) silty clay loam (B); moderate medium subangular blocky structure parting to moderate fine subangular blocky; friable; many fine roots throughout; few fine prominent dark yellowish brown (10YR 4/6) masses of iron accumulation in the matrix; very strongly acid; abrupt wavy boundary.

Btg1—14 to 21 inches; light brownish gray (2.5Y 6/2) silty clay loam; strong medium subangular blocky structure; firm; common fine roots throughout; few faint grayish brown (2.5Y 5/2) discontinuous clay films on faces of peds; few prominent white (10YR 8/1) discontinuous skeletans (silt) on faces of peds; few fine prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; extremely acid; clear smooth boundary.

Btg2—21 to 28 inches; grayish brown (2.5Y 5/2) silty clay; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common very fine and fine roots throughout; few faint grayish brown (2.5Y 5/2) discontinuous clay films on faces of peds; few prominent white (10YR 8/1) patchy skeletans (silt) on faces of peds; very strongly acid; gradual smooth boundary.

2Btg3—28 to 38 inches; olive gray (5Y 5/2) silty clay loam; moderate coarse prismatic structure parting to moderate medium subangular blocky; very firm; common very fine and fine roots between peds; few grayish brown (2.5Y 5/2) clay films on faces of peds; common fine prominent yellowish brown (10YR 5/4) masses of iron accumulation in the matrix; few faint yellowish red (5YR 5/8) patchy iron stains on faces of peds and common fine rounded soft masses of iron-manganese throughout; very strongly acid; gradual smooth boundary.

2Btg4—38 to 53 inches; grayish brown (2.5Y 5/2) silty clay loam; moderate coarse prismatic structure parting to weak medium subangular blocky; very firm; few fine roots between peds; few faint dark grayish brown (2.5Y 4/2) patchy clay films on faces of peds; common fine and medium prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common medium rounded iron concretions; very strongly acid; gradual smooth boundary.

3Btgb1—53 to 64 inches; gray (10YR 5/1) loam; weak coarse prismatic structure parting to weak medium subangular blocky; firm; few fine roots between peds; few prominent black (10YR 2/1) continuous organic coats in root channels and/or pores; few faint dark gray (10YR 4/1) patchy clay films on faces of peds; few coarse prominent strong brown (7.5YR 5/8) masses of iron accumulation in the matrix; common medium rounded barite crystals and common medium rounded iron concretions; slightly acid; 1 percent igneous pebbles; gradual smooth boundary.

3Btgb2—64 to 73 inches; dark gray (10YR 4/1) clay loam; weak medium subangular blocky structure; firm; few faint dark gray (10YR 4/1) patchy clay films on faces of peds; common medium and coarse prominent yellowish brown (10YR 5/8) masses of iron accumulation in the matrix; common medium rounded barite crystals and common medium rounded iron concretions; neutral; 1 percent igneous pebbles.

Range in Characteristics

Thickness of the loess: 30 to 55 inches
Depth to bedrock: More than 60 inches
Depth to carbonates: More than 60 inches
Depth to a claypan: 13 to 24 inches

A or Ap horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

Eg horizon:
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Texture—silt loam

Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay

2Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6

Chroma—1 or 2
Texture—silt clay loam, clay loam, loam, or silt loam

3Btgb horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt clay loam, clay loam, loam, or silt loam

12A—Wynoose silt loam, 0 to 2 percent slopes

Setting

Landform: Uplands
Position on the landform: Broad divides
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess over glacial drift
Runoff: Slow or very slow
Available water capacity: High or moderate
Seasonal high water table: Perched at the surface to 2 feet below the surface
Organic matter content: Low or moderately low
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 7 inches—grayish brown silt loam

Subsurface layer:
7 to 11 inches—light gray silt loam
11 to 14 inches—mixed light gray and light brownish gray silty clay loam

Subsoil:
14 to 21 inches—light brownish gray silty clay loam
21 to 28 inches—grayish brown silty clay
28 to 38 inches—olive gray silty clay loam
38 to 53 inches—grayish brown silty clay loam
53 to 64 inches—gray loam
64 to 73 inches—dark gray clay loam

Composition

Wynoose soil and similar inclusions: 100 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Wynoose soil
- Soils that have a thicker surface layer and subsurface layer than those of the Wynoose soil
- Soils that have a seasonal high water table at a depth of more than 1 foot

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The use of machinery is limited to periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species along the edges of fields.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3w

639A—Wynoose silt loam, bench, 0 to 2 percent slopes

Setting

Landform: Benches
Position on the landform: Broad flats and depressions
Major use: Cultivated crops

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess over glacial drift (outwash, ablation till)
Runoff: Slow or very slow
Available water capacity: High or moderate
Seasonal high water table: Perched at the surface to 2 feet below the surface
Organic matter content: Low or moderately low
Erosion hazard: None or slight
Shrink-swell potential: High
Potential for frost action: High

Typical Profile

Surface layer:
0 to 3 inches—dark brown silt loam

Subsurface layer:
3 to 22 inches—mixed light gray and gray silt loam

Subsoil:
22 to 37 inches—gray silty clay
37 to 47 inches—gray silty clay loam
47 to 60 inches—mixed light gray and gray silty clay loam

Composition

Wynoose soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that have a darker surface layer than that of the Wynoose soil
- Soils that have a thicker surface layer and subsurface layer than those of the Wynoose soil
- Soils that are more sloping than the Wynoose soil
- Soils that have a seasonal high water table at a depth of more than 2 feet

Contrasting inclusions:
- The somewhat poorly drained Hurst soils in drainageways and on convex slopes and side slopes
- The poorly drained Okaw soils in closed depressions and at the head of drainageways

Use and Management

Cropland
Management concerns: Wetness and tilth
Management measures or considerations:
- Measures that maintain a drainage system are needed.

- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
- Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay
Management concerns: Wetness and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, red clover, and switchgrass.

Forestland
Management measures or considerations:
- The use of machinery is limited to periods when the soil is firm enough to support the equipment.
- The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
- The forestland should be protected from livestock grazing.

Wildlife habitat
Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for wetland wildlife seedings, shrubs, and trees.

Dwellings
Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields
Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 3w

Zanesville Series

Depth class: Moderately deep to a fragipan and deep or very deep to bedrock
Drainage class: Moderately well drained
Permeability: Slow
Landform: Uplands

Position on the landform: Side slopes
Parent material: Loess and loamy residuum over bedrock
Slope range: 10 to 18 percent

Taxonomic classification: Fine-silty, mixed, active, mesic Oxyaquic Fragiudalfs

Typical Pedon

Zanesville silty clay loam, 10 to 18 percent slopes, severely eroded, 250 feet west and 100 feet north of the southeast corner of sec. 29, T. 1 S., R. 4 E., Jefferson County, Illinois:

Ap—0 to 2 inches; brown (10YR 4/3) silty clay loam, brown (10YR 5/3) dry; weak very fine granular structure; friable; common very fine and fine roots throughout; neutral; abrupt smooth boundary.

Bt1—2 to 8 inches; yellowish brown (10YR 5/6) silty clay loam; moderate medium subangular blocky structure; firm; common very fine and fine roots throughout; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds and in pores and few prominent light gray (10YR 7/2) skeletans (silt); common fine rounded iron-manganese concretions; neutral; clear smooth boundary.

Bt2—8 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; strong fine subangular blocky structure; firm; common very fine and fine roots between peds; common distinct brown (10YR 4/3) clay films on faces of peds and in pores; few fine distinct gray (10YR 5/1) iron depletions in the matrix; few prominent light gray (10YR 7/2) skeletans (silt); few strong brown (7.5YR 5/6) iron stains; common fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

Bt3—13 to 17 inches; strong brown (7.5YR 4/6) silty clay loam; strong fine angular blocky structure; firm; common very fine and fine roots between peds; common distinct brown (7.5YR 4/4) clay films on faces of peds and in pores; few prominent light gray (10YR 7/2) skeletans (silt); common fine prominent gray (10YR 5/1) iron depletions in the matrix; few faint strong brown (7.5YR 5/6) iron stains; common fine rounded iron-manganese concretions; very strongly acid; clear smooth boundary.

B/E—17 to 19 inches; strong brown (7.5YR 4/6) silty clay loam; moderate fine subangular blocky structure; firm; common very fine and fine roots between peds; few distinct dark yellowish brown (10YR 4/4) clay films on faces of peds and in pores; common prominent light gray (10YR 7/2) skeletans (silt); few fine prominent gray (10YR 5/1) iron depletions in the matrix; few faint strong brown (7.5YR 5/6) iron stains; common fine rounded iron-manganese concretions; very strongly acid; abrupt smooth boundary.

2Btx1—19 to 34 inches; brown (7.5YR 4/4) silty clay loam; moderate very coarse prismatic structure parting to weak medium subangular blocky; extremely firm, brittle; few fine roots between peds; few prominent brown (10YR 4/3) clay films on faces of peds and in pores; common fine and medium distinct light brownish gray (10YR 6/2) and common medium distinct pale brown (10YR 6/3) iron depletions in the matrix; few distinct strong brown (7.5YR 5/6) iron stains; common fine and medium irregular soft masses of iron-manganese and common fine and medium irregular barite crystals; very strongly acid; 2 percent sedimentary pebbles; clear smooth boundary.

2Btx2—34 to 40 inches; brown (7.5YR 4/4) loam; moderate coarse and very coarse prismatic structure parting to weak medium subangular blocky; extremely firm, brittle; few fine roots between peds; few prominent brown (10YR 4/3) clay films on faces of peds and in pores; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few distinct strong brown (7.5YR 4/6) iron stains; common fine and medium irregular soft masses of iron-manganese and common fine and medium irregular iron concretions; common fine cylindrical barite crystals; very strongly acid; 3 percent sedimentary pebbles; clear smooth boundary.

3Btb—40 to 50 inches; brown (7.5YR 4/4) loam; weak medium subangular blocky structure; very firm; few prominent brown (10YR 4/3) clay films on faces of peds and in pores; common fine and medium distinct light brownish gray (10YR 6/2) iron depletions in the matrix; few distinct strong brown (7.5YR 4/6) iron stains; common fine and medium irregular soft masses of iron-manganese and common fine and medium irregular iron concretions; very strongly acid; 15 percent sandstone-shale pebbles; clear smooth boundary.

3Cr—50 to 60 inches; 80 percent strong brown (7.5YR 4/6) and 20 percent light brownish gray (10YR 6/2), weathered bedrock; massive; extremely firm; very strongly acid.

Range in Characteristics

Thickness of the loess: 19 to 40 inches
Depth to bedrock: 40 to 80 inches
Carbonates: None
Depth to the fragipan: 20 to 32 inches

Ap or A horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 4
Texture—silt loam or silty clay loam

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—2 to 6
Texture—silt loam or silty clay loam

2Btx horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture—silty clay loam, silt loam, loam, clay loam, or sandy clay loam

3Btb horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam, silt loam, loam, clay loam, or sandy clay loam

3C horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam, silt loam, loam, sandy clay loam, or weathered bedrock

340D3—Zanesville silty clay loam, 10 to 18 percent slopes, severely eroded

Setting

Landform: Uplands
Position on the landform: Side slopes
Major uses: Cultivated crops and pasture

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Slow
Parent material: Loess and loamy residuum over bedrock
Runoff: Rapid
Available water capacity: Low or moderate
Seasonal high water table: Perched at a depth of 2 to 3 feet
Organic matter content: Low
Erosion hazard: Severe
Shrink-swell potential: Low
Potential for frost action: Moderate

Typical Profile

Surface layer:
0 to 2 inches—brown silty clay loam

Subsoil:
2 to 8 inches—yellowish brown silty clay loam
8 to 13 inches—yellowish brown silty clay loam
13 to 19 inches—strong brown silty clay loam
19 to 40 inches—brown, brittle silty clay loam and loam
40 to 50 inches—brown loam

Bedrock:
50 to 60 inches—mixed strong brown and light brownish gray, weathered bedrock

Composition

Zanesville soil and similar inclusions: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Inclusions

Similar inclusions:
- Soils that contain less loess than the Zanesville soil
- Soils that are brittle within a depth of 20 inches
- Soils that are more sloping than the Zanesville soil
- Soils that are more than 80 inches deep over bedrock

Contrasting inclusions:
- The somewhat poorly drained Blair soils at the head of drainageways and on concave side slopes
- The well drained Hickory soils on the steeper side slopes

Use and Management

Cropland
Management measures or considerations:
- Because of the hazard of erosion and the shallow depth to a fragipan, this soil is generally unsuited to use as cropland.

Pasture and hay
Management concerns: Erosion and tilth
Management measures or considerations:
- A cover of grasses and legumes improves tilth and helps to control erosion.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.
- Suitable species include orchardgrass, tall fescue, alfalfa, and switchgrass.

Forestland

Management measures or considerations:
- The forestland should be protected from livestock grazing.

Wildlife habitat

Management measures or considerations:
- Wildlife habitat should be protected from fire and from livestock grazing.
- Wildlife habitat can be enhanced by maintaining a shrub and brushy edge cover and by maintaining a wide diversity of tree and plant species.
- Retaining dead trees as nesting sites and keeping fallen logs and brush piles along the edges of fields help to protect prey species.
- This soil is suitable for upland wildlife seedings, shrubs, and trees.

Dwellings

Management concerns: Wetness and the shrink-swell potential
Management measures or considerations:
- Onsite investigation is needed.
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Management concerns: Wetness and restricted permeability
Management measures or considerations:
- Onsite investigation is required. The design of absorption fields should meet local and state guidelines.

Interpretive Groups

Land capability classification: 6e

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as forestland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The estimated yields of the main crops and pasture plants are listed, the system of land capability classification used by the Natural Resources Conservation Service is explained, and prime farmland is described.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading “Soil Series and Detailed Soil Map Units.” Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of map units in the survey area also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forestland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit (USDA, 1961). Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have few limitations that restrict their use.

Class 2 soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class 5 soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation.

Class 7 soils have very severe limitations that make them unsuitable for cultivation.

Class 8 soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e*

shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, forestland, wildlife habitat, or recreation.

The acreage of soils in each capability class and subclass is shown in table 7. The capability classification of map units in this survey area is given in the section "Soil Series and Detailed Soil Map Units" and in the yields table.

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil qualities, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. It is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

A recent trend in land use in some parts of the survey area has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, droughty, and less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 8. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in table 5. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Soil Series and Detailed Soil Map Units."

Hydric Soils

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed.

The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in “Soil Taxonomy” (Soil Survey Staff, 1999) and “Keys to Soil Taxonomy” (Soil Survey Staff, 2003) and in the “Soil Survey Manual” (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in “Field Indicators of Hydric Soils in the United States” (Hurt and others, 2002).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

The following map units meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 2002).

2A—Cisne silt loam, 0 to 2 percent slopes
12A—Wynoose silt loam, 0 to 2 percent slopes
84A—Okaw silt loam, 0 to 2 percent slopes
109A—Racoon silt loam, 0 to 2 percent slopes
287A—Chauncey silt loam, 0 to 2 percent slopes
376A—Cisne silt loam, bench, 0 to 2 percent slopes
639A—Wynoose silt loam, bench, 0 to 2 percent slopes
1085A—Jacob silty clay, undrained, 0 to 2 percent slopes, frequently flooded
1108A—Bonnie silt loam, undrained, 0 to 2 percent slopes, frequently flooded
3085A—Jacob silty clay, 0 to 2 percent slopes, frequently flooded
3108A—Bonnie silt loam, 0 to 2 percent slopes, frequently flooded
3422A—Cape silty clay loam, 0 to 2 percent slopes, frequently flooded

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of

nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

Forestland Management and Productivity

The tables described in this section can help forest owners or managers plan the use of soils for wood crops. They show the potential productivity of the soils for wood crops and rate the soils according to the limitations that affect various aspects of forestland management.

Forestland Management

Tables 9a and 9b provide interpretive ratings for several specific forest management practices. In these tables, some of the rating class terms indicate the degree to which the soils are suited to the practice. *Well suited* indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. *Moderately well suited* indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable, and fair performance can be expected. Some maintenance is needed. *Poorly suited* indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. *Unsuited* indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

Other rating class terms indicate the degree of limitation that restricts the use of a soil for a specific purpose. A rating of *slight* indicates that the soil properties are favorable for the use. Good performance and low maintenance can be expected. *Moderate* indicates that the soil properties are moderately favorable for the use and that the limitations can be overcome or modified by special planning, design, or maintenance. The expected performance is somewhat less desirable than that for soils rated *slight.* A rating of *severe* is given to soils that have one or more properties unfavorable for the specified use. The degree of limitation generally requires major soil reclamation, special design, or intensive maintenance.

The paragraphs that follow indicate the soil properties considered in rating the soils for forestland management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet.

In table 9a, the ratings in the column *construction limitations for haul roads and log landings* are based on slope, flooding, permafrost, plasticity index, the hazard of soil slippage, the content of sand, the Unified classification, rock fragments on or below the surface, depth to a restrictive layer that is indurated, depth to a water table, and ponding. The limitations are described as slight, moderate, or severe. *Slight* indicates that no significant limitations affect construction activities, *moderate* indicates that one or more limitations can cause some difficulty in construction, and *severe* indicates that one or more limitations can make construction very difficult or very costly.

The ratings in the column *suitability for log landings* are based on slope, rock fragments on the surface, plasticity index, the content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The soils are described as well suited, moderately suited, or poorly suited to use as log landings.

The ratings in the column *harvest equipment operability for logging areas* are based on slope, landscape stability, water table duration, stoniness, the content of boulders,

soil texture, and flooding. The soils are described as well suited, moderately suited, or poorly suited.

In table 9b, ratings in the column *erosion hazard on roads and trails* are based on soil erosion factor K, slope, and content of rock fragments. The ratings apply to unsurfaced roads and trails. The hazard is described as slight, moderate, or severe. A rating of *slight* indicates that little or no erosion is likely; *moderate* indicates that some erosion is likely, that the roads or trails may require occasional maintenance, or that simple erosion-control measures are needed; and *severe* indicates that significant erosion is expected, that the roads or trails require frequent maintenance, and that costly erosion-control measures are needed.

Ratings in the column *suitability for roads (natural surface)* are based on slope, rock fragments on the surface, plasticity index, the content of sand, the Unified classification, depth to a water table, ponding, flooding, and the hazard of soil slippage. The ratings indicate the suitability of the natural surface of the soil for roads. The soils are described as well suited, moderately suited, or poorly suited to this use.

Forestland Productivity

Table 10 provides information about the *potential productivity* of the soils for merchantable or *common trees*. The species considered are white oak, northern red oak, white ash, tulip poplar, eastern cottonwood, and pin oak. A *site index* is listed for soils on which the species are commonly grown. The site indices in this table are from University of Illinois Bulletins 810 and 811 (Olson and others, 2000; Olson and Lang, 2000). The site index is the average height, in feet, that the dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that forest managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

Suggested trees to plant are those that are suitable for commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 11 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in the table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery.

Recreation

The soils of the survey area are rated in table 12 according to limitations that affect their suitability for recreational development. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 12, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these.

The information in table 12 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields, dwellings without basements, and local roads and streets.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and

water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 13, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bear.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading “Soil Properties.”

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills,

septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 14 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, or other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table,

depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 15 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

The table also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can

cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 16 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavation and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of

excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones or have a water table at a depth of 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent; are wet; or have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 16, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 17 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is

affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity (fig. 6). Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Figure 6.—This grassed waterway in a soybean field helps to control erosion and surface-water runoff in an area of Bluford soils.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 18 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Detailed Soil Map Units."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1

through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Tables 19 and 20 show estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated.

In table 19, *clay* as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In the table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^{1}/_{3}$-bar moisture tension. Weight is determined after the soil is dried at 105 degrees C. In table 19, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability (Ksat) refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (Ksat). The estimates in the table indicate the rate of water movement, in inches per hour, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect retention of water and depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Erosion factors are shown in table 19 as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the "National Soil Survey Handbook" (USDA, NRCS).

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

In table 20, *soil reaction* is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is

important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 20, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Cation-exchange capacity is the total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Water Features

Table 21 gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Water table refers to a saturated zone in the soil. Table 21 indicates the depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone for the specified *months* in most years. Estimates of the upper and lower limits are based mainly on

observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

The table also shows the kind of water table—that is, perched or apparent. An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. Table 21 indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* of flooding are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

Soil Features

Table 22 gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

A *restrictive layer* is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen

layers. *Depth to top* is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel or concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel or concrete in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion also is expressed as *low, moderate,* or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487–00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep water habitats of the United States. U.S. Fish and Wildlife Service. FWS/OBS–79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., P.M. Whited, and R.F. Pringle, editors. Version 5.0, 2002. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Olson, K.R., and J.M. Lang. 2000. Optimum crop, pasture, and forest productivity ratings for Illinois soils. University of Illinois-Urbana, College of Agricultural, Consumer, and Environmental Sciences. Office of Research Bulletin 811.

Olson, K.R., J.M. Lang, J.D. Garcia-Paredes, R.N. Majchrzak, C.I. Hadley, M.E. Woolery, and R.M. Rejesus. 2000. Average crop, pasture, and forest productivity ratings for Illinois soils. University of Illinois-Urbana, College of Agricultural, Consumer, and Environmental Sciences. Office of Research Bulletin 810.

Preloger, David E. 2003. Soil survey of Franklin and Jefferson Counties, Illinois. U.S. Department of Agriculture, Natural Resources Conservation Service, in cooperation with Illinois Agricultural Experiment Station.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2003. Keys to soil taxonomy. 9th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y–87–1.

United States Department of Agriculture. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210.

United States Department of Agriculture. 1981. Land resource regions and major land resource areas of the United States. Soil Conservation Service. U.S. Department of Agriculture Handbook 296. (Map revised in 2004.)

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430–VI. [http://soils.usda.gov/technical/]

Glossary

Many of the terms relating to landforms, geology, and geomorphology are defined in more detail in the "National Soil Survey Handbook" (available in local offices of the Natural Resources Conservation Service or on the Internet).

Ablation till. A general term for loose, relatively permeable earthy material deposited during the downwasting of nearly static glacial ice, either contained within or accumulated on the surface of the glacier.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvial fan. The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium. Unconsolidated material, such as gravel, sand, silt, clay, and various mixtures of these, deposited on land by running water.

Alpha,alpha-dipyridyl. A compound that when dissolved in ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction implies reducing conditions and the likely presence of redoximorphic features.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction toward which a slope faces. Also called slope aspect.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Beach deposits. Material, such as sand and gravel, that is generally laid down parallel to an active or relict shoreline of a postglacial or glacial lake.

Beach ridge. A low, essentially continuous mound of beach or beach-and-dune material accumulated by the action of waves and currents on the backshore of a beach, beyond the present limit of storm waves or the reach of ordinary tides, and occurring singly or as one of a series of approximately parallel deposits. The ridges are roughly parallel to the shoreline and represent successive positions of an advancing shoreline.

Bedding plane. A planar or nearly planar bedding surface that visibly separates each successive layer of stratified sediment or rock (of the same or different lithology) from the preceding or following layer; a plane of deposition. It commonly marks a change in the circumstances of deposition and may show a parting, a color difference, a change in particle size, or various combinations of these. The term is commonly applied to any bedding surface, even one that is conspicuously bent or deformed by folding.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Bench (geologic). A nearly level to gently inclined erosional landscape in areas generally parallel and adjacent to modern streams. The materials deposited on benches is loess, outwash, and ablation till, and the modern soils formed in these materials.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Blowout. A saucer-, cup-, or trough-shaped depression formed by wind erosion on a preexisting dune or other sand deposit, especially in an area of shifting sand or loose soil or where protective vegetation is disturbed or destroyed; the adjoining accumulation of sand derived from the depression, where recognizable, is commonly included. Blowouts are commonly small.

Bog. Waterlogged, spongy ground, consisting primarily of mosses, containing acidic, decaying vegetation (such as sphagnum, sedges, and heaths) that develops into peat.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Canopy. The leafy crown of trees or shrubs. (See Crown.)

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or “chain,” of soils on a landscape that formed in similar kinds of parent material and under similar climatic conditions but that have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay depletions. See Redoximorphic features.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Climax plant community. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

COLE (coefficient of linear extensibility). See Linear extensibility.

Colluvium. Unconsolidated, unsorted earth material being transported or deposited on side slopes and/or at the base of slopes by mass movement (e.g., direct gravitational action) and by local, unconcentrated runoff.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Concretions. See Redoximorphic features.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Coprogenous earth (sedimentary peat). A type of limnic layer composed predominantly of fecal material derived from aquatic animals.

Corrosion (geomorphology). A process of erosion whereby rocks and soil are removed or worn away by natural chemical processes, especially by the solvent

action of running water, but also by other reactions, such as hydrolysis, hydration, carbonation, and oxidation.

Corrosion (soil survey interpretations). Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depression. Any relatively sunken part of the Earth's surface; especially a low-lying area surrounded by higher ground. A closed depression has no natural outlet for surface drainage. An open depression has a natural outlet for surface drainage.

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained,* and *very poorly drained*. These classes are defined in the "Soil Survey Manual."

Drainage, surface. Runoff, or surface flow of water, from an area.

Drainageway. A general term for a course or channel along which water moves in draining an area. A term restricted to relatively small, linear depressions that at some time move concentrated water and either do not have a defined channel or have only a small defined channel.

Drift. A general term applied to all mineral material (clay, silt, sand, gravel, and boulders) transported by a glacier and deposited directly by or from the ice or transported by running water emanating from a glacier. Drift includes unstratified material (till) that forms moraines and stratified deposits that form outwash plains, eskers, kames, varves, and glaciofluvial sediments. The term is generally applied to Pleistocene glacial deposits in areas that no longer contain glaciers.

Dune. A low mound, ridge, bank, or hill of loose, windblown granular material (generally sand), either barren and capable of movement from place to place or covered and stabilized with vegetation but retaining its characteristic shape.
Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.
Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.
Eolian deposit. Sand-, silt-, or clay-sized clastic material transported and deposited primarily by wind, commonly in the form of a dune or a sheet of sand or loess.
Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.
Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.
Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, such as a fire, that exposes the surface.

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Most commonly applied to cliffs produced by differential erosion. Synonym: scarp.
Esker. A long, narrow, sinuous, steep-sided ridge of stratified sand and gravel deposited as the bed of a stream flowing in an ice tunnel within or below the ice (subglacial) or between ice walls on top of the ice of a wasting glacier and left behind as high ground when the ice melted. Eskers range in length from less than a kilometer to more than 160 kilometers and in height from 3 to 30 meters.
Excess fines (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.
Farmdale Geosol. A catena of paleosols that developed in Roxana or older deposits.
Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.
Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.
Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity*.
Fine textured soil. Sandy clay, silty clay, or clay.
First bottom. An obsolete, informal term loosely applied to the lowest flood-plain steps that are subject to regular flooding.
Flood plain. The nearly level plain that borders a stream and is subject to flooding unless protected artificially.

Flood-plain landforms. A variety of constructional and erosional features produced by stream channel migration and flooding. Examples include backswamps, flood-plain splays, meanders, meander belts, meander scrolls, oxbow lakes, and natural levees.

Flood-plain splay. A fan-shaped deposit or other outspread deposit formed where an overloaded stream breaks through a levee (natural or artificial) and deposits its material (commonly coarse grained) on the flood plain.

Flood-plain step. An essentially flat, terrace-like alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface still actively modified by fluvial scour and/or deposition. May occur individually or as a series of steps.

Fluvial. Of or pertaining to rivers or streams; produced by stream or river action.

Footslope. The concave surface at the base of a hillslope. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

Forb. Any herbaceous plant not a grass or a sedge.

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Geomorphology. The science that treats the general configuration of the earth's surface; specifically the study of the classification, description, nature, origin, and development of landforms and their relationships to underlying structures, and the history of geologic changes as recorded by these surface features. The term is especially applied to the genetic interpretation of landforms.

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur in the form of outwash plains, valley trains, deltas, kames, eskers, and kame terraces.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are bedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock as much as 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water. Water filling all the unblocked pores of the material below the water table.

Gully. A small channel with steep sides caused by erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. The distinction between a

gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric material and the more decomposed sapric material.

Herbaceous peat. An accumulation of organic material, decomposed to some degree, which is predominantly the remains of sedges, reeds, cattails, and other herbaceous plants.

High-chroma zones. Zones having chroma of 3 or more. Typical color in areas of iron concentrations.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the “Soil Survey Manual.” The major horizons of mineral soil are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

L horizon.—A layer of organic and mineral limnic materials, including coprogenous earth (sedimentary peat), diatomaceous earth, and marl.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

Igneous rock. Rock that was formed by cooling and solidification of magma and that has not been changed appreciably by weathering since its formation. Major varieties include plutonic and volcanic rock (e.g., andesite, basalt, and granite).

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Interfluve. A landform composed of the relatively undissected upland or ridge between two adjacent valleys containing streams flowing in the same general direction. An elevated area between two drainageways that sheds water to those drainageways.

Interfluve (geomorphology). A geomorphic component of hills consisting of the uppermost, comparatively level or gently sloping area of a hill; shoulders of backwearing hillslopes can narrow the upland or can merge, resulting in a strongly convex shape.

Intermittent stream. A stream, or reach of a stream, that does not flow year-round but that is commonly dry for 3 or more months out of 12 and whose channel is generally below the local water table. It flows only during wet periods or when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron depletions. See Redoximorphic features.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation include:

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Kame. A low mound, knob, hummock, or short irregular ridge composed of stratified sand and gravel deposited by a subglacial stream as a fan or delta at the margin of a melting glacier; by a supraglacial stream in a low place or hole on the surface of the glacier; or as a ponded deposit on the surface or at the margin of stagnant ice.

Knoll. A small, low, rounded hill rising above adjacent landforms.

Ksat. Saturated hydraulic conductivity. (See Permeability.)

Lacustrine deposit. Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Lake bed. The bottom of a lake; a lake basin.

Lake plain. A nearly level surface marking the floor of an extinct lake filled by well sorted, generally fine textured, stratified deposits, commonly containing varves.

Lake terrace. A narrow shelf, partly cut and partly built, produced along a lakeshore in front of a scarp line of low cliffs and later exposed when the water level falls.

Lakeshore. A narrow strip of land in contact with or bordering a lake; especially the beach of a lake.

Lamella. A thin (commonly less than 1 cm thick), discontinuous or continuous, generally horizontal layer of fine material (especially clay and iron oxides) that has been pedogenically concentrated (illuviated within a coarser textured eluviated layer several centimeters to several decimeters thick).

Landslide. A general, encompassing term for most types of mass movement landforms and processes involving the downslope transport and outward deposition of soil and rock materials caused by gravitational forces; the movement may or may not involve saturated materials. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Linear extensibility. Refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. Linear extensibility is used to determine the shrink-swell potential of soils. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. Volume change is influenced by the amount and type of clay minerals in the soil. The volume change is the percent change for the whole soil. If it is expressed as a fraction, the resulting value is COLE, coefficient of linear extensibility.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Material transported and deposited by wind and consisting dominantly of silt-sized particles.

Low strength. The soil is not strong enough to support loads.

Low-chroma zones. Zones having chroma of 2 or less. Typical color in areas of iron depletions.

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

MAP. Mean annual precipitation, expressed in inches.

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal proportions; formed primarily under freshwater lacustrine conditions but also formed in more saline environments.

Mass movement. A generic term for the dislodgment and downslope transport of soil and rock material as a unit under direct gravitational stress.

Masses. See Redoximorphic features.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth's crust. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. A kind of map unit that has little or no natural soil and supports little or no vegetation.

MLRA (major land resource area). A geographic area characterized by a particular pattern of land uses, elevation and topography, soils, climate, water resources, and potential natural vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

Moraine. In terms of glacial geology, a mound, ridge, or other topographically distinct accumulation of unsorted, unstratified drift, predominantly till, deposited primarily by the direct action of glacial ice in a variety of landforms. Also, a general term for a landform composed mainly of till (except for kame moraines, which are composed mainly of stratified outwash) that has been deposited by a glacier. Some types of moraines are disintegration, end, ground, kame, lateral, recessional, and terminal.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Mucky peat. Unconsolidated soil material consisting primarily of organic matter that is in an intermediate stage of decomposition such that a significant part of the material can be recognized and a significant part of the material can not be recognized.

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nodules. See Redoximorphic features.

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

Outwash. Stratified and sorted sediments (chiefly sand and gravel) removed or "washed out" from a glacier by meltwater streams and deposited in front of or beyond the end moraine or the margin of a glacier. The coarser material is deposited nearer to the ice.

Outwash plain. An extensive lowland area of coarse textured glaciofluvial material. An outwash plain is commonly smooth; where pitted, it generally is low in relief.

Paleosol. A soil that formed on a landscape in the past with distinctive morphological features resulting from a soil-forming environment that no longer exists at the site. The former pedogenic process was either altered because of external environmental change or interrupted by burial.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as "saturated hydraulic conductivity," which is defined in the "Soil Survey Manual." In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as "permeability." Terms describing permeability, measured in inches per hour, are as follows:

Impermeable	less than 0.0015 inch
Very slow	0.0015 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and flooding.

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Pore linings. See Redoximorphic features.

Potential native plant community. See Climax plant community.

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed as pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. See Redoximorphic features.

Redoximorphic depletions. See Redoximorphic features.

Redoximorphic features. Redoximorphic features are associated with wetness and result from alternating periods of reduction and oxidation of iron and manganese compounds in the soil. Reduction occurs during saturation with water, and oxidation occurs when the soil is not saturated. Characteristic color patterns are created by these processes. The reduced iron and manganese ions may be removed from a soil if vertical or lateral fluxes of water occur, in which case there is no iron or manganese precipitation in that soil. Wherever the iron and manganese are oxidized and precipitated, they form either soft masses or hard concretions or nodules. Movement of iron and manganese as a result of

redoximorphic processes in a soil may result in redoximorphic features that are defined as follows:

1. Redoximorphic concentrations.—These are zones of apparent accumulation of iron-manganese oxides, including:

   A. Nodules and concretions, which are cemented bodies that can be removed from the soil intact. Concretions are distinguished from nodules on the basis of internal organization. A concretion typically has concentric layers that are visible to the naked eye. Nodules do not have visible organized internal structure; *and*

   B. Masses, which are noncemented concentrations of substances within the soil matrix; *and*

   C. Pore linings, i.e., zones of accumulation along pores that may be either coatings on pore surfaces or impregnations from the matrix adjacent to the pores.

2. Redoximorphic depletions.—These are zones of low chroma (chromas less than those in the matrix) where either iron-manganese oxides alone or both iron-manganese oxides and clay have been stripped out, including:

   A. Iron depletions, i.e., zones that contain low amounts of iron and manganese oxides but have a clay content similar to that of the adjacent matrix; *and*

   B. Clay depletions, i.e., zones that contain low amounts of iron, manganese, and clay (often referred to as silt coatings or skeletans).

3. Reduced matrix.—This is a soil matrix that has low chroma *in situ* but undergoes a change in hue or chroma within 30 minutes after the soil material has been exposed to air.

Reduced matrix. See Redoximorphic features.

Regolith. All unconsolidated earth materials above the solid bedrock. It includes material weathered in place from all kinds of bedrock and alluvial, glacial, eolian, lacustrine, and pyroclastic deposits.

Relief. The relative difference in elevation between the upland summits and the lowlands or valleys of a given region.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as bedrock disintegrated in place.

Rill. A very small, steep-sided channel resulting from erosion and cut in unconsolidated materials by concentrated but intermittent flow of water. A rill generally is not an obstacle to wheeled vehicles and is shallow enough to be smoothed over by ordinary tillage.

Rise. A slight increase in elevation of the land surface, typically with a broad summit and gently sloping sides.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone. The part of the soil that can be penetrated by plant roots.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sangamon Geosol. A catena of paleosols that developed in Illinoian or older deposits.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saturated hydraulic conductivity (Ksat). See Permeability.

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. A consolidated deposit of clastic particles, chemical precipitates, or organic remains accumulated at or near the surface of the earth under normal low temperature and pressure conditions. Sedimentary rocks include consolidated equivalents of alluvium, colluvium, drift, and eolian, lacustrine, and marine deposits. Examples are sandstone, siltstone, mudstone, claystone, shale, conglomerate, limestone, dolomite, and coal.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock that formed by the hardening of a deposit of clay, silty clay, or silty clay loam and that has a tendency to split into thin layers.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shoulder. The convex, erosional surface near the top of a hillslope. A shoulder is a transition from summit to backslope.

Shrink-swell (in tables). The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Side slope (geomorphology). A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel. Side slopes are dominantly colluvium and slope-wash sediments.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides (pedogenic). Grooved, striated, and/or glossy (shiny) slip faces on structural peds, such as wedges; produced by shrink-swell processes, most commonly in soils that have a high content of expansive clays.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specified use.

Slope alluvium. Sediment gradually transported down the slopes of mountains or hills primarily by nonchannel alluvial processes (i.e., slope-wash processes) and characterized by particle sorting. Lateral particle sorting is evident on long slopes. In a profile sequence, sediments may be distinguished by differences in size and/or specific gravity of rock fragments and may be separated by stone lines. Burnished peds and sorting of rounded or subrounded pebbles or cobbles distinguish these materials from unsorted colluvial deposits.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief and by the passage of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stream channel. The hollow bed where a natural stream of surface water flows or may flow; the deepest or central part of the bed, formed by the main current and covered more or less continuously by water.

Stream terrace. One of a series of platforms in a stream valley, flanking and more or less parallel to the stream channel, originally formed near the level of the stream; represents the remnants of an abandoned flood plain, stream bed, or valley floor produced during a former state of fluvial erosion or deposition.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind erosion and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsidence. The potential decrease in surface elevation as a result of the drainage of wet soils that have organic layers or semifluid, mineral layers. Subsidence, as a result of drainage, is attributed to (1) shrinkage from drying, (2) consolidation because of the loss of ground-water buoyancy, (3) compaction from tillage or manipulation, (4) wind erosion, (5) burning, and (6) biochemical oxidation.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons, considered collectively. It includes all subdivisions of these horizons.

Swale. A slight depression in the midst of generally level land. A shallow depression in an undulating ground moraine due to uneven glacial deposition.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. An end moraine that marks the farthest advance of a glacier. It typically has the form of a massive arcuate or concentric ridge, or complex of ridges, and is underlain by till and other types of drift.

Terrace (conservation). An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field generally is built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

Terrace (geomorphology). A steplike surface, bordering a valley floor or shoreline, that represents the former position of a flood plain, lake, or seashore. The term is usually applied both to the relatively flat summit surface (tread) that was cut or built by stream or wave action and to the steeper descending slope (scarp or riser) that has graded to a lower base level of erosion.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material that is too thin for the specified use.

Till. Dominantly unsorted and nonstratified drift, generally unconsolidated and deposited directly by a glacier without subsequent reworking by meltwater, and consisting of a heterogeneous mixture of clay, silt, sand, gravel, stones, and boulders; rock fragments of various lithologies are embedded within a finer matrix that can range from clay to sandy loam.

Till plain. An extensive area of level to gently undulating soils underlain predominantly by till and bounded at the distal end by subordinate recessional or end moraines.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toeslope. The gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.
Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.
Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.
Upland. An informal, general term for the higher ground of a region, in contrast with a low-lying adjacent area, such as a valley or plain, or for land at a higher elevation than the flood plain or low stream terrace; land above the footslope zone of the hillslope continuum.
Weathering. All physical disintegration, chemical decomposition, and biologically induced changes in rocks or other deposits at or near the earth's surface by atmospheric or biologic agents or by circulating surface waters but involving essentially no transport of the altered material.
Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.
Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.
Windthrow. The uprooting and tipping over of trees by the wind.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Mt. Vernon, Illinois)

Month	Temperature						Precipitation			
				2 years in 10 will have--				2 years in 10 will have--		
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more
	°F	°F	°F	°F	°F	Units	In	In	In	
January----	38.2	19.2	28.7	67	-13	5	2.23	0.80	3.42	4
February---	43.0	23.2	33.1	71	-6	8	2.62	1.25	3.80	5
March------	54.7	33.8	44.2	81	10	63	4.10	2.34	5.67	7
April------	66.8	44.3	55.6	86	24	216	4.23	2.67	5.65	8
May--------	76.3	52.9	64.6	91	34	432	4.42	2.50	6.11	7
June-------	85.4	61.8	73.6	97	45	706	3.39	1.91	4.71	6
July-------	88.9	66.0	77.5	99	51	807	4.04	1.82	5.94	5
August-----	87.1	63.7	75.4	100	49	774	3.15	1.33	4.69	4
September--	80.6	56.9	68.7	95	37	550	3.28	1.69	4.67	4
October----	69.2	44.6	56.9	88	25	240	2.80	1.29	4.26	4
November---	55.6	35.7	45.6	78	14	72	3.94	1.80	5.77	6
December---	42.5	24.7	33.6	69	-3	11	3.58	1.85	5.09	6
Yearly:										
Average---	65.7	43.9	54.8	---	---	---	---	---	---	---
Extreme---	104	-20	---	101	-14	---	---	---	---	---
Total-----	---	---	---	---	---	3,884	41.78	34.72	47.44	66

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Mt. Vernon, Illinois)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 7	Apr. 12	Apr. 30
2 years in 10 later than--	Apr. 1	Apr. 8	Apr. 24
5 years in 10 later than--	Mar. 22	Mar. 29	Apr. 13
First freezing temperature in fall:			
1 year in 10 earlier than--	Oct. 28	Oct. 16	Oct. 7
2 years in 10 earlier than--	Nov. 2	Oct. 22	Oct. 12
5 years in 10 earlier than--	Nov. 13	Nov. 1	Oct. 22

Table 3.--Growing Season

(Recorded in the period 1961-90 at Mt. Vernon, Illinois)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	195	184	160
8 years in 10	202	191	168
5 years in 10	217	203	182
2 years in 10	231	215	196
1 year in 10	239	222	204

Table 4.--Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Atlas	Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs
Ava	Fine-silty, mixed, active, mesic Oxyaquic Fragiudalfs
Belknap	Coarse-silty, mixed, active, acid, mesic Fluvaquentic Endoaquepts
Blair	Fine-silty, mixed, superactive, mesic Aquic Hapludalfs
Bluford	Fine, smectitic, mesic Aeric Fragic Epiaqualfs
Bonnie	Fine-silty, mixed, active, acid, mesic Typic Fluvaquents
Cape	Fine, smectitic, acid, mesic Vertic Endoaquepts
Chauncey	Fine, smectitic, mesic Typic Argialbolls
Cisne	Fine, smectitic, mesic Mollic Albaqualfs
Colp	Fine, smectitic, mesic Aquertic Chromic Hapludalfs
Creal	Fine-silty, mixed, superactive, mesic Aeric Endoaqualfs
Grantsburg	Fine-silty, mixed, active, mesic Oxyaquic Fragiudalfs
Hickory	Fine-loamy, mixed, active, mesic Typic Hapludalfs
Hoyleton	Fine, smectitic, mesic Aquollic Hapludalfs
Hurst	Fine, smectitic, mesic Aeric Chromic Vertic Epiaqualfs
Jacob	Very fine, smectitic, acid, mesic Vertic Endoaquepts
Kell	Fine-loamy, mixed, active, mesic Ultic Hapludalfs
Lenzburg	Fine-loamy, mixed, active, calcareous, mesic Haplic Udarents
Okaw	Fine, smectitic, mesic Chromic Vertic Albaqualfs
Orthents	Fine-loamy, mixed, active, nonacid, mesic Typic Udorthents
*Parke	Fine-silty, mixed, active, mesic Typic Hapludalfs
*Pike	Fine-silty, mixed, active, mesic Typic Hapludalfs
Plumfield	Fine-silty, mixed, active, mesic Aquic Fragiudalfs
Racoon	Fine-silty, mixed, superactive, mesic Typic Endoaqualfs
Rend	Fine-silty, mixed, active, mesic Fragic Oxyaquic Hapludalfs
Richview	Fine-silty, mixed, superactive, mesic Mollic Oxyaquic Hapludalfs
Schuline	Fine-loamy, mixed, active, calcareous, mesic Alfic Udarents
Sharon	Coarse-silty, mixed, active, acid, mesic Oxyaquic Udifluvents
Wynoose	Fine, smectitic, mesic Typic Albaqualfs
Zanesville	Fine-silty, mixed, active, mesic Oxyaquic Fragiudalfs

Table 5.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
2A	Cisne silt loam, 0 to 2 percent slopes	6,413	2.3
3A	Hoyleton silt loam, 0 to 2 percent slopes	11,427	4.1
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded	5,076	1.8
4B2	Richview silt loam, 2 to 5 percent slopes, eroded	1,566	0.6
4C2	Richview silt loam, 5 to 10 percent slopes, eroded	594	0.2
5C3	Blair silty clay loam, 5 to 10 percent slopes, severely eroded	11,381	4.1
8D3	Hickory clay loam, 10 to 18 percent slopes, severely eroded	4,815	1.7
10C	Plumfield silty clay loam, 5 to 10 percent slopes	9,865	3.6
10D	Plumfield silty clay loam, 10 to 18 percent slopes	1,735	0.6
12A	Wynoose silt loam, 0 to 2 percent slopes	8,174	3.0
13A	Bluford silt loam, 0 to 2 percent slopes	25,836	9.4
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	15,690	5.7
14B	Ava silt loam, 2 to 5 percent slopes	20,031	7.2
14B2	Ava silt loam, 2 to 5 percent slopes, eroded	8,124	2.9
14C2	Ava silt loam, 5 to 10 percent slopes, eroded	8,648	3.1
15D3	Parke silty clay loam, 10 to 18 percent slopes, severely eroded	1,003	0.4
84A	Okaw silt loam, 0 to 2 percent slopes	3,100	1.1
109A	Racoon silt loam, 0 to 2 percent slopes	2,099	0.8
122B	Colp silt loam, 2 to 5 percent slopes	2,561	0.9
122B2	Colp silt loam, 2 to 5 percent slopes, eroded	94	*
122C3	Colp silty clay loam, 5 to 10 percent slopes, severely eroded	863	0.3
122D3	Colp silty clay loam, 10 to 18 percent slopes, severely eroded	308	0.1
287A	Chauncey silt loam, 0 to 2 percent slopes	361	0.1
301B	Grantsburg silt loam, 2 to 5 percent slopes	4,250	1.5
301C3	Grantsburg silty clay loam, 5 to 10 percent slopes, severely eroded	3,010	1.1
337A	Creal silt loam, 0 to 2 percent slopes	779	0.3
338A	Hurst silt loam, 0 to 2 percent slopes	3,531	1.3
340D3	Zanesville silty clay loam, 10 to 18 percent slopes, severely eroded	1,326	0.5
376A	Cisne silt loam, bench, 0 to 2 percent slopes	3,565	1.3
377A	Hoyleton silt loam, bench, 0 to 2 percent slopes	1,627	0.6
377B2	Hoyleton silt loam, bench, 2 to 5 percent slopes, eroded	1,168	0.4
421G	Kell silt loam, 35 to 60 percent slopes	165	*
518B	Rend silt loam, 2 to 5 percent slopes	910	0.3
518B2	Rend silt loam, 2 to 5 percent slopes, eroded	5,173	1.9
518C2	Rend silt loam, 5 to 10 percent slopes, eroded	2,045	0.7
533	Urban land	552	0.2
536	Dumps, mine	849	0.3
583B	Pike silt loam, 2 to 5 percent slopes	1,019	0.4
583C2	Pike silt loam, 5 to 10 percent slopes, eroded	1,353	0.5
639A	Wynoose silt loam, bench, 0 to 2 percent slopes	6,943	2.5
640A	Bluford silt loam, bench, 0 to 2 percent slopes	7,121	2.6
802B	Orthents, loamy, undulating	3,409	1.2
802F	Orthents, loamy, hilly and very hilly	206	*
823B	Schuline silt loam, 1 to 5 percent slopes	826	0.3
866	Dumps, slurry	453	0.2
871D	Lenzburg gravelly silty clay loam, 7 to 20 percent slopes	56	*
908F	Hickory-Kell silt loams, 18 to 35 percent slopes	3,992	1.4
927D3	Blair-Atlas silty clay loams, 10 to 18 percent slopes, severely eroded	2,580	0.9
1085A	Jacob silty clay, undrained, 0 to 2 percent slopes, frequently flooded	1,121	0.4
1108A	Bonnie silt loam, undrained, 0 to 2 percent slopes, frequently flooded	3,182	1.2
3072A	Sharon silt loam, 0 to 2 percent slopes, frequently flooded	2,022	0.7
3085A	Jacob silty clay, 0 to 2 percent slopes, frequently flooded	2,509	0.9
3108A	Bonnie silt loam, 0 to 2 percent slopes, frequently flooded	14,395	5.2
3382A	Belknap silt loam, 0 to 2 percent slopes, frequently flooded	26,107	9.4
3422A	Cape silty clay loam, 0 to 2 percent slopes, frequently flooded	5,118	1.9
W	Water	15,039	5.4
	Total	276,165	100.0

* Less than 0.1 percent.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture

(Crop and hay yields are those that can be expected under an optimum level of management. They were taken from Bulletin 811, published by the University of Illinois in 2000. Pasture yields are those that can be expected under an average level of management. They were taken from Bulletin 810, also published by the University of Illinois in 2000. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Land capability	Corn	Grain sorghum	Soybeans	Winter wheat	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
2A:							
Cisne	3w	135	102	41	53	4.18	6.2
3A:							
Hoyleton	2w	132	103	42	52	4.18	6.2
3B2:							
Hoyleton	2e	128	100	41	50	4.10	5.9
4B2:							
Richview	2e	130	100	41	51	3.30	5.0
4C2:							
Richview	3e	127	97	40	50	3.25	4.8
5C3:							
Blair	4e	107	85	34	43	3.40	4.9
8D3:							
Hickory	4e	88	---	30	36	3.00	4.2
10C:							
Plumfield	4e	82	70	27	32	2.30	3.4
10D:							
Plumfield	6e	---	---	---	---	2.00	3.1
12A:							
Wynoose	3w	115	97	38	46	3.84	5.7
13A:							
Bluford	2w	122	99	40	50	3.05	4.5
13B2:							
Bluford	2e	113	92	37	46	2.90	4.3
14B:							
Ava	2e	120	95	39	49	2.90	4.3
14B2:							
Ava	2e	112	89	36	46	2.70	4.1
14C2:							
Ava	3e	109	86	35	45	2.60	3.8
15D3:							
Parke	4e	112	84	35	43	2.60	3.8
84A:							
Okaw	3w	116	---	38	50	3.40	5.0
109A:							
Racoon	3w	130	103	41	51	3.50	5.2

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Grain sorghum	Soybeans	Winter wheat	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
122B:							
Colp----------------	3e	120	---	38	50	3.80	5.6
122B2:							
Colp----------------	3e	113	---	35	47	3.60	5.4
122C3:							
Colp----------------	4e	89	---	27	38	2.80	4.8
122D3:							
Colp----------------	6e	---	---	---	---	2.50	4.4
287A:							
Chauncey------------	2w	145	105	46	57	4.29	6.3
301B:							
Grantsburg----------	2e	119	93	41	49	2.90	4.3
301C3:							
Grantsburg----------	4e	89	70	30	37	2.20	3.1
337A:							
Creal---------------	2w	136	106	43	53	3.62	5.3
338A:							
Hurst---------------	2w	121	106	39	50	3.73	5.5
340D3:							
Zanesville----------	6e	---	---	---	---	2.30	3.5
376A:							
Cisne, bench--------	3w	135	102	41	53	4.18	6.2
377A:							
Hoyleton, bench-----	2w	132	103	42	52	4.18	6.2
377B2:							
Hoyleton, bench-----	2e	128	100	41	50	4.10	5.9
421G:							
Kell----------------	7e	---	---	---	---	---	---
518B:							
Rend----------------	2e	140	103	44	53	4.00	6.0
518B2:							
Rend----------------	2e	134	99	42	51	3.90	5.7
518C2:							
Rend----------------	3e	131	97	40	50	3.80	5.5
533.							
Urban land							
536.							
Dumps, mine							
583B:							
Pike----------------	2e	144	106	43	56	3.80	5.6

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Grain sorghum	Soybeans	Winter wheat	Grass-legume hay	Grass-legume pasture
		Bu	Bu	Bu	Bu	Tons	AUM*
583C2:							
Pike----------------	3e	135	100	41	53	3.60	5.2
639A:							
Wynoose, bench------	3w	115	97	38	46	3.84	5.7
640A:							
Bluford, bench------	2w	122	99	40	50	3.05	4.5
802B, 802F.							
Orthents, loamy							
823B:							
Schuline------------	2e	119	101	38	41	2.90	4.3
866.							
Dumps, slurry							
871D:							
Lenzburg------------	6s	---	---	---	---	3.20	4.8
908F:							
Hickory-------------	6e	---	---	---	---	2.20	4.2
Kell----------------	6e	---	---	---	---	2.10	4.1
927D3:							
Blair---------------	6e	---	---	---	---	3.10	4.4
Atlas---------------	6e	---	---	---	---	2.10	3.5
1085A:							
Jacob---------------	5w	---	---	---	---	---	---
1108A:							
Bonnie--------------	5w	---	---	---	---	---	---
3072A:							
Sharon--------------	2w	133	---	43	---	3.90	5.7
3085A:							
Jacob---------------	4w	85	---	31	---	2.75	4.1
3108A:							
Bonnie--------------	3w	121	---	40	---	3.80	5.6
3382A:							
Belknap-------------	3w	127	---	42	---	4.00	5.9
3422A:							
Cape----------------	3w	111	---	38	---	3.50	5.1
W.							
Water							

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 7.--Capability Classes and Subclasses

(Miscellaneous areas, water areas, and Orthents are excluded. Absence of an entry indicates no acreage)

Class	Total acreage	Major management concerns (subclass)			
		Erosion (e)	Wetness (w)	Soil problem (s)	Climate (c)
		Acres	Acres	Acres	Acres
1	---	---	---	---	---
2	104,029	56,660	47,369	---	---
3	82,598	13,931	68,667	---	---
4	31,406	29,022	2,384	---	---
5	4,303	---	4,303	---	---
6	6,780	6,732	---	48	---
7	315	315	---	---	---

Table 8.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
2A	Cisne silt loam, 0 to 2 percent slopes (where drained)
3A	Hoyleton silt loam, 0 to 2 percent slopes
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded
4B2	Richview silt loam, 2 to 5 percent slopes, eroded
13A	Bluford silt loam, 0 to 2 percent slopes (where drained)
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded
14B	Ava silt loam, 2 to 5 percent slopes
14B2	Ava silt loam, 2 to 5 percent slopes, eroded
109A	Racoon silt loam, 0 to 2 percent slopes (where drained)
122B	Colp silt loam, 2 to 5 percent slopes
122B2	Colp silt loam, 2 to 5 percent slopes, eroded
287A	Chauncey silt loam, 0 to 2 percent slopes (where drained)
301B	Grantsburg silt loam, 2 to 5 percent slopes
337A	Creal silt loam, 0 to 2 percent slopes (where drained)
376A	Cisne silt loam, bench, 0 to 2 percent slopes (where drained)
377A	Hoyleton silt loam, bench, 0 to 2 percent slopes
377B2	Hoyleton silt loam, bench, 2 to 5 percent slopes, eroded
518B	Rend silt loam, 2 to 5 percent slopes
518B2	Rend silt loam, 2 to 5 percent slopes, eroded
583B	Pike silt loam, 2 to 5 percent slopes
640A	Bluford silt loam, bench, 0 to 2 percent slopes (where drained)
823B	Schuline silt loam, 1 to 5 percent slopes
3072A	Sharon silt loam, 0 to 2 percent slopes, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3108A	Bonnie silt loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3382A	Belknap silt loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3422A	Cape silty clay loam, 0 to 2 percent slopes, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)

Table 9a.--Forestland Management

(See text for an explanation of terms used in this table)

Map symbol and soil name	Construction limitations for haul roads and log landings	Suitability for log landings	Harvest equipment operability for logging areas
2A:			
Cisne	Moderate: Low strength	Moderately suited: Wetness Low strength	Moderately suited: Low strength
3A:			
Hoyleton	Moderate: Low strength	Moderately suited: Low strength Wetness	Moderately suited: Low strength
3B2:			
Hoyleton	Moderate: Low strength	Moderately suited: Low strength Wetness	Moderately suited: Low strength
4B2:			
Richview	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
4C2:			
Richview	Moderate: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength
5C3:			
Blair	Moderate: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength
8D3:			
Hickory	Moderate: Low strength	Poorly suited: Slope Low strength	Moderately suited: Low strength
10C:			
Plumfield	Moderate: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength
10D:			
Plumfield	Moderate: Low strength	Poorly suited: Slope Low strength	Moderately suited: Low strength
12A:			
Wynoose	Moderate: Low strength	Moderately suited: Wetness Low strength	Moderately suited: Low strength
13A:			
Bluford	Moderate: Low strength	Moderately suited: Low strength Wetness	Moderately suited: Low strength
13B2:			
Bluford	Moderate: Low strength	Moderately suited: Low strength Wetness	Moderately suited: Low strength

Table 9a.-Forestland Management--Continued

Map symbol and soil name	Construction limitations for haul roads and log landings	Suitability for log landings	Harvest equipment operability for logging areas
14B:			
Ava	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
14B2:			
Ava	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
14C2:			
Ava	Moderate: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength
15D3:			
Parke	Moderate: Low strength	Poorly suited: Slope Low strength	Moderately suited: Low strength
84A:			
Okaw	Moderate: Low strength	Poorly suited: Ponding Wetness Low strength	Moderately suited: Low strength
109A:			
Racoon	Moderate: Low strength	Poorly suited: Wetness Ponding Low strength	Moderately suited: Low strength
122B:			
Colp	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
122B2:			
Colp	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
122C3:			
Colp	Moderate: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength
122D3:			
Colp	Moderate: Stickiness Low strength	Poorly suited: Slope Low strength	Moderately suited: Low strength
287A:			
Chauncey	Moderate: Low strength	Moderately suited: Wetness Low strength	Moderately suited: Low strength
301B:			
Grantsburg	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
301C3:			
Grantsburg	Moderate: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength

Table 9a.-Forestland Management--Continued

Map symbol and soil name	Construction limitations for haul roads and log landings	Suitability for log landings	Harvest equipment operability for logging areas
337A:			
Creal	Moderate: Low strength	Moderately suited: Low strength Wetness	Moderately suited: Low strength
338A:			
Hurst	Moderate: Low strength	Moderately suited: Low strength Wetness	Moderately suited: Low strength
340D3:			
Zanesville	Moderate: Low strength	Poorly suited: Slope Low strength	Moderately suited: Low strength
376A:			
Cisne, bench	Moderate: Low strength	Moderately suited: Wetness Low strength	Moderately suited: Low strength
377A:			
Hoyleton, bench	Moderate: Low strength	Moderately suited: Low strength Wetness	Moderately suited: Low strength
377B2:			
Hoyleton, bench	Moderate: Low strength	Moderately suited: Low strength Wetness	Moderately suited: Low strength
421G:			
Kell	Severe: Slope	Poorly suited: Slope Low strength	Poorly suited: Slope Low strength
518B:			
Rend	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
518B2:			
Rend	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
518C2:			
Rend	Moderate: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength
533.			
Urban land			
536.			
Dumps, mine			
583B:			
Pike	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
583C2:			
Pike	Moderate: Low strength	Moderately suited: Low strength Slope	Moderately suited: Low strength

Table 9a.-Forestland Management--Continued

Map symbol and soil name	Construction limitations for haul roads and log landings	Suitability for log landings	Harvest equipment operability for logging areas
639A:			
Wynoose, bench------	Moderate: Low strength	Moderately suited: Wetness Low strength	Moderately suited: Low strength
640A:			
Bluford, bench------	Moderate: Low strength	Moderately suited: Low strength Wetness	Moderately suited: Low strength
802B:			
Orthents, loamy-----	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
802F:			
Orthents, loamy-----	Moderate: Slope Low strength	Poorly suited: Slope Low strength	Moderately suited: Slope Low strength
823B:			
Schuline------------	Moderate: Low strength	Moderately suited: Low strength	Moderately suited: Low strength
866.			
Dumps, slurry			
871D:			
Lenzburg------------	Moderate: Low strength	Poorly suited: Slope Low strength	Moderately suited: Low strength
908F:			
Hickory-------------	Moderate: Slope Low strength	Poorly suited: Slope Low strength	Moderately suited: Low strength Slope
Kell----------------	Moderate: Slope Low strength	Poorly suited: Slope Low strength	Moderately suited: Low strength Slope
927D3:			
Blair---------------	Moderate: Low strength	Poorly suited: Slope Low strength	Moderately suited: Low strength
Atlas---------------	Moderate: Stickiness Low strength	Poorly suited: Slope Low strength Stickiness Wetness	Moderately suited: Low strength Stickiness
1085A:			
Jacob---------------	Severe: Flooding Stickiness Low strength	Poorly suited: Ponding Flooding Wetness Stickiness Low strength	Moderately suited: Low strength Stickiness

Table 9a.-Forestland Management--Continued

Map symbol and soil name	Construction limitations for haul roads and log landings	Suitability for log landings	Harvest equipment operability for logging areas
1108A:			
Bonnie	Severe: Flooding Low strength	Poorly suited: Ponding Flooding Wetness Low strength	Moderately suited: Low strength
3072A:			
Sharon	Severe: Flooding Low strength	Poorly suited: Flooding Low strength	Moderately suited: Low strength
3085A:			
Jacob	Severe: Flooding Stickiness Low strength	Poorly suited: Flooding Wetness Ponding Stickiness Low strength	Moderately suited: Low strength Stickiness
3108A:			
Bonnie	Severe: Flooding Low strength	Poorly suited: Ponding Flooding Wetness Low strength	Moderately suited: Low strength
3382A:			
Belknap	Severe: Flooding Low strength	Poorly suited: Flooding Low strength	Moderately suited: Low strength
3422A:			
Cape	Severe: Flooding Low strength	Poorly suited: Flooding Wetness Ponding Low strength	Moderately suited: Low strength
W.			
Water			

Table 9b.--Forestland Management

(See text for an explanation of terms used in this table)

Map symbol and soil name	Erosion hazard on roads and trails	Suitability for roads (natural surface)
2A:		
Cisne	Slight	Moderately suited: Wetness Low strength
3A:		
Hoyleton	Slight	Moderately suited: Low strength
3B2:		
Hoyleton	Moderate: Slope/erodibility	Moderately suited: Low strength
4B2:		
Richview	Moderate: Slope/erodibility	Moderately suited: Low strength
4C2:		
Richview	Moderate: Slope/erodibility	Moderately suited: Low strength Slope
5C3:		
Blair	Moderate: Slope/erodibility	Moderately suited: Low strength Slope
8D3:		
Hickory	Moderate: Slope/erodibility	Poorly suited: Slope Low strength
10C:		
Plumfield	Moderate: Slope/erodibility	Moderately suited: Low strength Slope
10D:		
Plumfield	Severe: Slope/erodibility	Poorly suited: Slope Low strength
12A:		
Wynoose	Slight	Moderately suited: Wetness Low strength
13A:		
Bluford	Slight	Moderately suited: Low strength
13B2:		
Bluford	Moderate: Slope/erodibility	Moderately suited: Low strength
14B:		
Ava	Moderate: Slope/erodibility	Moderately suited: Low strength

Table 9b.--Forestland Management--Continued

Map symbol and soil name	Erosion hazard on roads and trails	Suitability for roads (natural surface)
14B2:		
Ava	Moderate: Slope/erodibility	Moderately suited: Low strength
14C2:		
Ava	Moderate: Slope/erodibility	Moderately suited: Low strength Slope
15D3:		
Parke	Severe: Slope/erodibility	Poorly suited: Slope Low strength
84A:		
Okaw	Slight	Poorly suited: Ponding Wetness Low strength
109A:		
Racoon	Slight	Poorly suited: Wetness Ponding Low strength
122B:		
Colp	Moderate: Slope/erodibility	Moderately suited: Low strength
122B2:		
Colp	Moderate: Slope/erodibility	Moderately suited: Low strength
122C3:		
Colp	Moderate: Slope/erodibility	Moderately suited: Low strength Slope
122D3:		
Colp	Severe: Slope/erodibility	Poorly suited: Slope Low strength
287A:		
Chauncey	Slight	Moderately suited: Wetness Low strength
301B:		
Grantsburg	Moderate: Slope/erodibility	Moderately suited: Low strength
301C3:		
Grantsburg	Moderate: Slope/erodibility	Moderately suited: Low strength Slope
337A:		
Creal	Slight	Moderately suited: Low strength Wetness

Table 9b.--Forestland Management--Continued

Map symbol and soil name	Erosion hazard on roads and trails	Suitability for roads (natural surface)
338A:		
Hurst	Slight	Moderately suited: Low strength Wetness
340D3:		
Zanesville	Severe: Slope/erodibility	Poorly suited: Slope Low strength
376A:		
Cisne, bench	Slight	Moderately suited: Wetness Low strength
377A:		
Hoyleton, bench	Slight	Moderately suited: Low strength
377B2:		
Hoyleton, bench	Moderate: Slope/erodibility	Moderately suited: Low strength
421G:		
Kell	Severe: Slope/erodibility	Poorly suited: Slope Low strength
518B:		
Rend	Moderate: Slope/erodibility	Moderately suited: Low strength
518B2:		
Rend	Moderate: Slope/erodibility	Moderately suited: Low strength
518C2:		
Rend	Moderate: Slope/erodibility	Moderately suited: Low strength Slope
533. Urban land		
536. Dumps, mine		
583B:		
Pike	Moderate: Slope/erodibility	Moderately suited: Low strength
583C2:		
Pike	Moderate: Slope/erodibility	Moderately suited: Low strength Slope
639A:		
Wynoose, bench	Slight	Moderately suited: Wetness Low strength

Table 9b.--Forestland Management--Continued

Map symbol and soil name	Erosion hazard on roads and trails	Suitability for roads (natural surface)
640A:		
Bluford, bench	Slight	Moderately suited: Low strength
802B:		
Orthents, loamy	Moderate: Slope/erodibility	Moderately suited: Low strength
802F:		
Orthents, loamy	Severe: Slope/erodibility	Poorly suited: Slope Low strength
823B:		
Schuline	Moderate: Slope/erodibility	Moderately suited: Low strength
866.		
Dumps, slurry		
871D:		
Lenzburg	Severe: Slope/erodibility	Poorly suited: Slope Low strength
908F:		
Hickory	Severe: Slope/erodibility	Poorly suited: Slope Low strength
Kell	Severe: Slope/erodibility	Poorly suited: Slope Low strength
927D3:		
Blair	Severe: Slope/erodibility	Poorly suited: Slope Low strength
Atlas	Severe: Slope/erodibility	Poorly suited: Slope Low strength Stickiness Wetness
1085A:		
Jacob	Slight	Poorly suited: Ponding Flooding Wetness Stickiness Low strength
1108A:		
Bonnie	Slight	Poorly suited: Ponding Flooding Wetness Low strength

Table 9b.--Forestland Management--Continued

Map symbol and soil name	Erosion hazard on roads and trails	Suitability for roads (natural surface)
3072A:		
Sharon	Slight	Poorly suited: Flooding Low strength
3085A:		
Jacob	Slight	Poorly suited: Flooding Wetness Ponding Stickiness Low strength
3108A:		
Bonnie	Slight	Poorly suited: Ponding Flooding Wetness Low strength
3382A:		
Belknap	Slight	Poorly suited: Flooding Low strength
3422A:		
Cape	Slight	Poorly suited: Wetness Ponding Flooding Low strength
W.		
Water		

Table 10.--Forestland Productivity

(Site index values were taken from productivity ratings in Bulletin 810, published by the University of Illinois in 2000)

Map symbol and soil name	Potential productivity: Common trees	Potential productivity: Site index	Suggested trees to plant
2A:			
Cisne	Eastern cottonwood	96	Green ash, pin oak, red maple.
	Pin oak	87	
	Tulip poplar	84	
3A:			
Hoyleton	Eastern cottonwood	102	Cherrybark oak, eastern cottonwood, green ash, pin oak.
	Northern red oak	74	
	White oak	78	
	Tulip poplar	88	
3B2:			
Hoyleton	Eastern cottonwood	99	Cherrybark oak, green ash, hickory, pin oak, white oak.
	Northern red oak	72	
	White oak	71	
	Tulip poplar	85	
4B2:			
Richview	Eastern cottonwood	107	Black oak, hickory, northern red oak, white oak.
	Northern red oak	77	
	White oak	75	
	Tulip poplar	90	
4C2:			
Richview	Eastern cottonwood	105	Black oak, hickory, northern red oak, white oak.
	Northern red oak	75	
	White oak	73	
	Tulip poplar	87	
5C3:			
Blair	Eastern cottonwood	83	Black oak, hickory, northern red oak, white ash, white oak.
	Northern red oak	67	
	White oak	66	
	Tulip poplar	77	
8D3:			
Hickory	Eastern cottonwood	86	Black oak, eastern cottonwood, eastern white pine, hickory, northern red oak, white oak.
	Northern red oak	61	
	White ash	65	
	White oak	65	
10C:			
Plumfield	Northern red oak	64	Black oak, eastern cottonwood, hickory, northern red oak, white oak, tulip poplar.
	White ash	63	
	White oak	58	
10D:			
Plumfield	Northern red oak	60	Black oak, eastern cottonwood, hickory, northern red oak, white oak, tulip poplar.
	White ash	53	
	White oak	54	
12A:			
Wynoose	Eastern cottonwood	98	Bur oak, cottonwood, green ash, overcup oak, pin oak, red maple, swamp white oak.
	Pin oak	89	

Table 10.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Suggested trees to plant
13A:			
Bluford	Eastern cottonwood	103	Bur oak, cherrybark oak, eastern cottonwood, green ash, pin oak, tulip poplar.
	Northern red oak	72	
	White ash	72	
	White oak	73	
	Tulip poplar	96	
13B2:			
Bluford	Eastern cottonwood	96	Black oak, green ash, hickory, northern red oak, white oak.
	Northern red oak	67	
	White ash	67	
	White oak	68	
	Tulip poplar	89	
14B:			
Ava	Northern red oak	71	Black oak, chinkapin oak, hickory, northern red oak, white ash, white oak.
	White ash	75	
	White oak	70	
	Tulip poplar	90	
14B2:			
Ava	Northern red oak	68	Black oak, hickory, northern red oak, white oak, tulip poplar.
	White ash	71	
	White oak	66	
	Tulip poplar	85	
14C2:			
Ava	Northern red oak	63	Black oak, hickory, northern red oak, white oak, tulip poplar.
	White ash	67	
	White oak	62	
	Tulip poplar	81	
15D3:			
Parke	Northern red oak	62	Black oak, hickory, northern red oak, white ash, white oak.
	White ash	75	
	White oak	60	
	Tulip poplar	75	
84A:			
Okaw	Eastern cottonwood	101	Baldcypress, green ash, pin oak, red maple, swamp white oak, water tupelo.
	Pin oak	91	
109A:			
Racoon	Eastern cottonwood	103	Baldcypress, pin oak, post oak, red maple, swamp white oak.
	Pin oak	93	
	Tulip poplar	91	
122B:			
Colp	Eastern cottonwood	104	Black oak, hickory, northern red oak, white ash, white oak, tulip poplar.
	Northern red oak	73	
	White ash	70	
	White oak	70	
122B2:			
Colp	Eastern cottonwood	96	Black oak, hickory, northern red oak, white ash, white oak, tulip poplar.
	Northern red oak	68	
	White ash	68	
	White oak	70	

Table 10.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Site index	Suggested trees to plant
122C3:			
Colp	Eastern cottonwood	76	Black oak, hickory, northern red oak, white ash, white oak, tulip poplar.
	Northern red oak	54	
	White ash	51	
	White oak	51	
122D3:			
Colp	Eastern cottonwood	65	Black oak, hickory, northern red oak, white ash, white oak, tulip poplar.
	Northern red oak	46	
	White ash	43	
	White oak	43	
287A:			
Chauncey	Eastern cottonwood	97	Bur oak, cypress, pin oak, red maple, swamp white oak.
	Pin oak	87	
301B:			
Grantsburg	White oak	70	Hickory, northern red oak, white ash, white oak, tulip poplar.
	Northern red oak	71	
	Eastern cottonwood	98	
	Tulip poplar	93	
301C3:			
Grantsburg	White ash	47	Black oak, hickory, northern red oak, white ash, white oak.
	White oak	51	
	Northern red oak	53	
	Eastern cottonwood	72	
337A:			
Creal	White oak	76	Cherrybark oak, green ash, hickory, white oak, tulip poplar.
	Northern red oak	75	
	White ash	81	
	Eastern cottonwood	102	
	Tulip poplar	89	
338A:			
Hurst	Eastern cottonwood	105	Cherrybark oak, green ash, hickory, pin oak, post oak, tulip poplar.
	Northern red oak	73	
	White ash	73	
	White oak	70	
340D3:			
Zanesville	White oak	45	Black oak, hickory, northern red oak, southern red oak, white oak.
	Northern red oak	43	
	Eastern cottonwood	66	
	White ash	44	
376A:			
Cisne, bench	Eastern cottonwood	96	Green ash, pin oak, red maple.
	Pin oak	87	
	Tulip poplar	84	
377A:			
Hoyleton, bench	Eastern cottonwood	102	Cherrybark oak, eastern cottonwood, green ash, hickory, pin oak, white oak.
	Northern red oak	74	
	White ash	78	
	White oak	73	
	Tulip poplar	88	

Table 10.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Potential productivity: Site index	Suggested trees to plant
377B2:			
Hoyleton, bench	Eastern cottonwood	99	Cherrybark oak, green ash, hickory, pin oak, white oak.
	Northern red oak	72	
	White oak	71	
	Tulip poplar	85	
421G:			
Kell	Northern red oak	35	Black oak, hickory, northern red oak, white oak.
	White ash	31	
	White oak	33	
518B:			
Rend	Eastern cottonwood	110	Black oak, hickory, northern red oak, white oak.
	Northern red oak	75	
	White ash	71	
	White oak	76	
518B2:			
Rend	Eastern cottonwood	105	Black oak, hickory, northern red oak, white oak.
	Northern red oak	72	
	White ash	69	
	White oak	73	
518C2:			
Rend	Eastern cottonwood	103	Black oak, hickory, northern red oak, white oak.
	Northern red oak	70	
	White ash	67	
	White oak	71	
533.			
Urban land			
536.			
Dumps, mine			
583B:			
Pike	Eastern cottonwood	109	Black oak, hickory, northern red oak, white ash, white oak.
	Northern red oak	77	
	White ash	77	
	White oak	75	
	Tulip poplar	96	
583C2:			
Pike	Eastern cottonwood	101	Black oak, hickory, northern red oak, white ash, white oak.
	Northern red oak	72	
	White ash	72	
	White oak	70	
	Tulip poplar	89	
639A:			
Wynoose, bench	Eastern cottonwood	98	Bur oak, green ash, overcup oak, pin oak, red maple, swamp white oak.
	Pin oak	89	
640A:			
Bluford, bench	Eastern cottonwood	103	Bur oak, cherrybark oak, eastern cottonwood, green ash, pin oak, tulip poplar.
	Northern red oak	72	
	White ash	72	
	White oak	73	
	Tulip poplar	96	

Table 10.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Potential productivity: Site index	Suggested trees to plant
802B, 802F. Orthents, loamy			
823B: Schuline	Eastern cottonwood	103	Black walnut, eastern white pine, green ash, loblolly pine, northern red oak, white ash, white oak.
	Northern red oak	73	
	White ash	90	
	White oak	76	
	Tulip poplar	79	
866. Dumps, slurry			
871D: Lenzburg	Eastern cottonwood	93	Black walnut, eastern cottonwood, green ash, white ash.
	Northern red oak	68	
	White ash	83	
	White oak	67	
908F: Hickory	Northern red oak	65	Black oak, hickory, northern red oak, white oak.
	White ash	69	
	White oak	69	
Kell	Northern red oak	57	Black oak, hickory, northern red oak, white oak.
	White ash	50	
	White oak	54	
927D3: Blair	Eastern cottonwood	70	Black oak, hickory, northern red oak, white oak.
	Northern red oak	56	
	White ash	58	
	White oak	56	
Atlas	Eastern cottonwood	68	Black oak, hickory, northern red oak, white oak.
	Northern red oak	57	
	White ash	54	
	White oak	50	
	Tulip poplar	56	
1085A: Jacob	Eastern cottonwood	85	Baldcypress, bur oak, eastern cottonwood, overcup oak, pin oak, swamp white oak, water tupelo.
	Pin oak	77	
1108A: Bonnie	Eastern cottonwood	100	Baldcypress, bur oak, eastern cottonwood, overcup oak, swamp white oak, sweetgum, tupelo.
	Pin oak	90	
3072A: Sharon	Eastern cottonwood	103	Black walnut, cherrybark oak, pecan, pin oak.
	Pin oak	93	
3085A: Jacob	Eastern cottonwood	85	Baldcypress, bur oak, eastern cottonwood, overcup oak, pin oak, swamp white oak, water tupelo.
	Pin oak	77	

Table 10.--Forestland Productivity--Continued

Map symbol and soil name	Potential productivity: Common trees	Potential productivity: Site index	Suggested trees to plant
3108A:			
Bonnie	Eastern cottonwood	100	Baldcypress, bur oak, eastern cottonwood, overcup oak, pin oak, red maple, swamp white oak, sweetgum.
	Pin oak	90	
3382A:			
Belknap	Eastern cottonwood	102	Baldcypress, cherrybark oak, eastern cottonwood, pecan, pin oak, red maple, sweetgum.
	Pin oak	92	
3422A:			
Cape	Eastern cottonwood	91	Baldcypress, bur oak, eastern cottonwood, overcup oak, pin oak, red maple, swamp white oak, sweetgum.
	Pin oak	83	
W.			
Water			

Table 11.--Windbreaks and Environmental Plantings

(Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
2A:					
Cisne	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
3A:					
Hoyleton	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
3B2:					
Hoyleton	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
4B2:					
Richview	Silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine
4C2:					
Richview	Silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine
5C3:					
Blair	Black chokeberry	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
8D3:					
Hickory	Common elderberry; coralberry; mapleleaf viburnum; silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
10C: Plumfield	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
10D: Plumfield	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
12A: Wynoose	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
13A:					
Bluford-----------------	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
13B2:					
Bluford-----------------	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
14B:					
Ava---------------------	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
14B2:					
Ava	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
14C2:					
Ava	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
15D3:					
Parke	Silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
84A:					
Okaw	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
109A:					
Racoon	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
122B:					
Colp	American cranberrybush; American hazelnut; black chokeberry; common juniper; coralberry; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; nannyberry; prairie crabapple; roughleaf dogwood; staghorn sumac; Washington hawthorn	Arborvitae; black oak; blackgum; bur oak; chinkapin oak; common hackberry; eastern redcedar; green ash; Virginia pine	Norway spruce	Carolina poplar

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
122B2:					
Colp	American cranberrybush; American hazelnut; black chokeberry; common juniper; coralberry; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; nannyberry; prairie crabapple; roughleaf dogwood; staghorn sumac; Washington hawthorn	Arborvitae; black oak; blackgum; bur oak; chinkapin oak; common hackberry; eastern redcedar; green ash; Virginia pine	Norway spruce	Carolina poplar
122C3:					
Colp	American cranberrybush; American hazelnut; black chokeberry; common juniper; coralberry; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; nannyberry; prairie crabapple; roughleaf dogwood; staghorn sumac; Washington hawthorn	Arborvitae; black oak; blackgum; bur oak; chinkapin oak; common hackberry; eastern redcedar; green ash; Virginia pine	Norway spruce	Carolina poplar
122D3:					
Colp	American cranberrybush; American hazelnut; black chokeberry; common juniper; coralberry; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; nannyberry; prairie crabapple; roughleaf dogwood; staghorn sumac; Washington hawthorn	Arborvitae; black oak; blackgum; bur oak; chinkapin oak; common hackberry; eastern redcedar; green ash; Virginia pine	Norway spruce	Carolina poplar

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
287A:					
Chauncey	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
301B:					
Grantsburg	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
301C3:					
Grantsburg	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
337A:					
Creal	American cranberrybush; black chokeberry; Canada yew; common elderberry; common juniper; common ninebark; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
338A:					
Hurst	American cranberrybush; American hazelnut; black chokeberry; common juniper; coralberry; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; nannyberry; prairie crabapple; roughleaf dogwood; staghorn sumac; Washington hawthorn	Arborvitae; black oak; blackgum; bur oak; chinkapin oak; common hackberry; eastern redcedar; green ash; Virginia pine	Norway spruce	Carolina poplar
340D3:					
Zanesville	American cranberrybush; American hazelnut; black chokeberry; common juniper; coralberry; gray dogwood; mapleleaf viburnum; silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; nannyberry; prairie crabapple; roughleaf dogwood; staghorn sumac; Washington hawthorn	Arborvitae; black oak; blackgum; bur oak; chinkapin oak; common hackberry; eastern redcedar; green ash; Virginia pine	Norway spruce	Carolina poplar

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
376A:					
Cisne, bench	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
377A:					
Hoyleton, bench	Black chokeberry	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
377B2:					
Hoyleton, bench	Black chokeberry	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
421G:					
Kell	American cranberrybush; American hazelnut; black chokeberry; common chokecherry; common elderberry; common juniper; coralberry; mapleleaf viburnum; silky dogwood	American plum; bur oak; chinkapin oak; common serviceberry; eastern redcedar; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac	Black oak; common hackberry; eastern white pine; green ash	Carolina poplar	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
518B:					
Rend	Silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine
518B2:					
Rend	Silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine
518C2:					
Rend	Silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine
533. Urban land					
536. Dumps, mine					

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
583B:					
Pike	Silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine
583C2:					
Pike	Silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine
639A:					
Wynoose, bench	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
640A:					
Bluford, bench	Black chokeberry; common juniper; common winterberry; northern spicebush; redosier dogwood; silky dogwood	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of-- <8	8-15	16-25	26-35	>35
802B:					
Orthents, loamy	Common winterberry; coralberry; gray dogwood; mapleleaf arrowwood; redosier dogwood	American plum; blackhaw; hazelnut; prairie crabapple; roughleaf dogwood	Eastern redcedar; nannyberry; northern white-cedar; shadbush; tamarack	Baldcypress; common hackberry; green ash; Norway spruce; tuliptree	Eastern cottonwood; eastern white pine; pin oak
802F:					
Orthents, loamy	Silky dogwood	American cranberrybush	Blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	Eastern white pine; pin oak
823B:					
Schuline	Silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine
866.					
Dumps, slurry					
871D:					
Lenzburg	American cranberrybush; American hazelnut; black chokeberry; common chokecherry; common elderberry; common juniper; coralberry; mapleleaf viburnum; silky dogwood	American plum; bur oak; chinkapin oak; common serviceberry; eastern redcedar; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac	Black oak; common hackberry; eastern white pine; green ash	Carolina poplar	---

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
908F:					
Hickory	Common elderberry; coralberry; mapleleaf viburnum; silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine
Kell	American cranberrybush; American hazelnut; black chokeberry; common chokecherry; common elderberry; common juniper; coralberry; mapleleaf viburnum; silky dogwood	American plum; bur oak; chinkapin oak; common serviceberry; eastern redcedar; nannyberry; prairie crabapple; roughleaf dogwood; smooth sumac	Black oak; common hackberry; eastern white pine; green ash	Carolina poplar	---
927D3:					
Blair	Silky dogwood	American cranberrybush	Blue spruce; northern white-cedar; Washington hawthorn; white fir	Austrian pine; Norway spruce	Eastern white pine; pin oak
Atlas	Black chokeberry	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
1085A:					
Jacob	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
1108A:					
Bonnie	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
3072A:					
Sharon	Silky dogwood	American plum; American witchhazel; blackhaw; common chokecherry; common serviceberry; prairie crabapple; roughleaf dogwood; smooth sumac; southern arrowwood	Arborvitae; blue spruce; common persimmon; eastern redcedar; nannyberry; pecan; Washington hawthorn; white oak	Black walnut; blackgum; common hackberry; Douglas fir; green ash; northern red oak; Norway spruce; pin oak; tuliptree	Carolina poplar; eastern cottonwood; eastern white pine

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
3085A:					
Jacob	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
3108A:					
Bonnie	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
3382A:					
Belknap	Black chokeberry	Blackhaw; cockspur hawthorn; common pawpaw; common serviceberry; prairie crabapple; roughleaf dogwood; rusty blackhaw; southern arrowwood; witchhazel	Arborvitae; Austrian pine; blue spruce; common persimmon; Douglas fir; eastern redcedar; green hawthorn; nannyberry; pecan; shingle oak	Blackgum; common hackberry; green ash; Norway spruce; red maple; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak

Table 11.--Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
3422A:					
Cape	American cranberrybush; black chokeberry; buttonbush; common elderberry; common ninebark; common winterberry; gray dogwood; highbush blueberry; northern spicebush; redosier dogwood; silky dogwood	Cockspur hawthorn; hazel alder; nannyberry; roughleaf dogwood	Arborvitae; blackgum; common hackberry; green hawthorn; northern white-cedar; shingle oak	Green ash; red maple; river birch; swamp white oak; sweetgum	Carolina poplar; eastern cottonwood; pin oak
W.					
Water					

Table 12.--Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2A:					
Cisne	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
3A:					
Hoyleton	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
3B2:					
Hoyleton	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
4B2:					
Richview	Slight	Slight	Moderate: slope	Slight	Slight
4C2:					
Richview	Slight	Slight	Severe: slope	Slight	Slight
5C3:					
Blair	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Severe: slope	Severe: erodes easily	Moderate: wetness
8D3:					
Hickory	Moderate: slope	Moderate: slope	Severe: slope	Severe: erodes easily	Moderate: slope
10C:					
Plumfield	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly slope	Severe: erodes easily	Moderate: wetness droughty
10D:					
Plumfield	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly slope	Severe: erodes easily	Moderate: slope wetness droughty
12A:					
Wynoose	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
13A:					
Bluford	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
13B2:					
Bluford	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
14B: Ava	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Severe: erodes easily	Moderate: wetness
14B2: Ava	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Severe: erodes easily	Moderate: wetness
14C2: Ava	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly slope	Severe: erodes easily	Moderate: wetness
15D3: Parke	Moderate: slope	Moderate: slope	Severe: slope	Severe: erodes easily	Moderate: slope
84A: Okaw	Severe: percs slowly ponding	Severe: percs slowly ponding	Severe: percs slowly ponding	Severe: ponding	Severe: ponding
109A: Racoon	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding
122B: Colp	Moderate: wetness	Moderate: percs slowly wetness	Moderate: percs slowly slope wetness	Severe: erodes easily	Slight
122B2: Colp	Moderate: wetness	Moderate: percs slowly wetness	Moderate: percs slowly slope wetness	Severe: erodes easily	Slight
122C3: Colp	Moderate: wetness	Moderate: percs slowly wetness	Severe: slope	Severe: erodes easily	Slight
122D3: Colp	Moderate: slope wetness	Moderate: percs slowly slope wetness	Severe: slope	Severe: erodes easily	Moderate: slope
287A: Chauncey	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness
301B: Grantsburg	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly	Severe: erodes easily	Moderate: wetness
301C3: Grantsburg	Severe: percs slowly	Severe: percs slowly	Severe: percs slowly slope	Severe: erodes easily	Moderate: wetness

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
337A: Creal	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
338A: Hurst	Severe: percs slowly wetness	Severe: percs slowly	Severe: percs slowly wetness	Severe: erodes easily	Moderate: wetness
340D3: Zanesville	Moderate: percs slowly slope wetness	Moderate: percs slowly slope wetness	Severe: slope	Severe: erodes easily	Moderate: slope
376A: Cisne, bench	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
377A: Hoyleton, bench	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
377B2: Hoyleton, bench	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
421G: Kell	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
518B: Rend	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: percs slowly slope wetness	Severe: erodes easily	Slight
518B2: Rend	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Moderate: percs slowly slope wetness	Severe: erodes easily	Slight
518C2: Rend	Moderate: percs slowly wetness	Moderate: percs slowly wetness	Severe: percs slowly slope	Severe: erodes easily	Slight
533. Urban land					
536. Dumps, mine					
583B: Pike	Slight	Slight	Moderate: slope	Severe: erodes easily	Slight
583C2: Pike	Slight	Slight	Severe: slope	Severe: erodes easily	Slight

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
639A:					
Wynoose, bench--	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: percs slowly wetness	Severe: wetness	Severe: wetness
640A:					
Bluford, bench--	Severe: wetness	Moderate: percs slowly wetness	Severe: wetness	Moderate: wetness	Moderate: wetness
802B:					
Orthents, loamy	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope	Severe: erodes easily	Slight
802F:					
Orthents, loamy	Severe: slope	Severe: slope	Severe: slope	Severe: erodes easily slope	Severe: slope
823B:					
Schuline--------	Moderate: percs slowly	Moderate: percs slowly	Moderate: percs slowly slope	Severe: erodes easily	Slight
866.					
Dumps, slurry					
871D:					
Lenzburg--------	Severe: slope	Severe: slope	Severe: slope	Moderate: slope	Moderate: large stones slope
908F:					
Hickory---------	Severe: slope	Severe: slope	Severe: slope	Severe: erodes easily slope	Severe: slope
Kell------------	Severe: slope	Severe: slope	Severe: slope	Severe slope	Severe: slope
927D3:					
Blair-----------	Moderate: percs slowly slope wetness	Moderate: percs slowly slope wetness	Severe: slope	Severe: erodes easily	Moderate: slope wetness
Atlas-----------	Severe: percs slowly wetness	Severe: percs slowly	Severe: percs slowly slope wetness	Severe: erodes easily	Moderate: slope wetness droughty
1085A:					
Jacob-----------	Severe: flooding percs slowly wetness	Severe: percs slowly too clayey wetness	Severe: flooding too clayey wetness	Severe: too clayey wetness	Severe: flooding too clayey wetness
1108A:					
Bonnie----------	Severe: flooding ponding	Severe: ponding	Severe: flooding ponding	Severe: ponding	Severe: flooding wetness ponding

Table 12.--Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
3072A:					
Sharon----------	Severe: flooding	Moderate: flooding	Severe: flooding	Moderate: flooding	Severe: flooding
3085A:					
Jacob-----------	Severe: flooding percs slowly wetness	Severe: percs slowly too clayey wetness	Severe: flooding too clayey wetness	Severe: too clayey wetness	Severe: flooding too clayey wetness
3108A:					
Bonnie----------	Severe: flooding wetness	Severe: wetness	Severe: flooding wetness	Severe: wetness	Severe: flooding wetness
3382A:					
Belknap---------	Severe: flooding wetness	Moderate: flooding percs slowly wetness	Severe: flooding wetness	Moderate: flooding wetness	Severe: flooding
3422A:					
Cape------------	Severe: flooding percs slowly wetness	Severe: percs slowly wetness	Severe: flooding percs slowly wetness	Severe: wetness	Severe: flooding wetness
W.					
Water					

Table 13.--Wildlife Habitat

(See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
2A:										
Cisne	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
3A:										
Hoyleton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
3B2:										
Hoyleton	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
4B2:										
Richview	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
4C2:										
Richview	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
5C3:										
Blair	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
8D3:										
Hickory	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
10C:										
Plumfield	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
10D:										
Plumfield	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor
12A:										
Wynoose	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
13A:										
Bluford	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
13B2:										
Bluford	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Very poor
14B:										
Ava	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
14B2:										
Ava	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
14C2:										
Ava	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
15D3:										
Parke	Poor	Fair	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
84A:										
Okaw	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
109A:										
Racoon	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
122B:										
Colp	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
122B2:										
Colp	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
122C3:										
Colp	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
122D3:										
Colp	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
287A:										
Chauncey	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
301B:										
Grantsburg	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor
301C3:										
Grantsburg	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
337A:										
Creal	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Poor
338A:										
Hurst	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair
340D3:										
Zanesville	Poor	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
376A:										
Cisne, bench	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
377A:										
Hoyleton, bench	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
377B2:										
Hoyleton, bench	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor
421G:										
Kell	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
518B:										
Rend	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
518B2:										
Rend	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
518C2:										
Rend	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
533. Urban land										
536. Dumps, mine										
583B:										
Pike	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
583C2:										
Pike	Fair	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
639A:										
Wynoose, bench	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
640A:										
Bluford, bench	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair
802B:										
Orthents, loamy	Good	Fair	Good	Good	Good	Poor	Poor	Good	Good	Poor
802F:										
Orthents, loamy	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
823B:										
Schuline	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
866. Dumps, slurry										
871D:										
Lenzburg	Poor	Fair	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor
908F:										
Hickory	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
Kell	Very poor	Poor	Good	Good	Good	Very poor	Very poor	Poor	Good	Very poor
927D3:										
Blair	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
Atlas	Fair	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor
1085A:										
Jacob	Very poor	Poor	Poor	Fair	Very poor	Fair	Good	Poor	Fair	Good

Table 13.--Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
1108A:										
Bonnie	Very poor	Very poor	Very poor	Fair	Very poor	Good	Good	Very poor	Poor	Good
3072A:										
Sharon	Poor	Fair	Fair	Good	Good	Poor	Very poor	Fair	Good	Very poor
3085A:										
Jacob	Very poor	Poor	Poor	Fair	Very poor	Fair	Good	Poor	Fair	Good
3108A:										
Bonnie	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good
3382A:										
Belknap	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair
3422A:										
Cape	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good
W.										
Water										

Table 14.--Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2A:						
Cisne-----------	Severe: wetness	Severe: shrink-swell wetness	Severe: wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
3A:						
Hoyleton--------	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: frost action low strength shrink-swell	Moderate: wetness
3B2:						
Hoyleton--------	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: frost action low strength shrink-swell	Moderate: wetness
4B2:						
Richview--------	Moderate: wetness	Moderate: shrink-swell	Moderate: shrink-swell wetness	Moderate: shrink-swell	Severe: frost action low strength	Slight
4C2:						
Richview--------	Moderate: wetness	Moderate: shrink-swell	Moderate: shrink-swell wetness	Moderate: shrink-swell	Severe: frost action low strength	Slight
5C3:						
Blair-----------	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell slope wetness	Severe: frost action low strength	Moderate: wetness
8D3:						
Hickory---------	Moderate: slope	Moderate: slope	Moderate: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: slope
10C:						
Plumfield-------	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: slope wetness	Severe: frost action low strength	Moderate: wetness droughty
10D:						
Plumfield-------	Severe: wetness	Moderate: slope wetness	Severe: wetness	Severe: slope	Severe: frost action low strength	Moderate: slope wetness droughty
12A:						
Wynoose---------	Severe: wetness	Severe: shrink-swell wetness	Severe: wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
13A:						
Bluford	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength	Moderate: wetness
13B2:						
Bluford	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength	Moderate: wetness
14B:						
Ava	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: frost action low strength	Moderate: wetness
14B2:						
Ava	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: frost action low strength	Moderate: wetness
14C2:						
Ava	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell slope wetness	Severe: frost action low strength	Moderate: wetness
15D3:						
Parke	Moderate: slope	Moderate: shrink-swell slope	Moderate: slope	Severe: slope	Severe: frost action low strength	Moderate: slope
84A:						
Okaw	Severe: ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: flooding shrink-swell ponding	Severe: low strength shrink-swell ponding	Severe: ponding
109A:						
Racoon	Severe: ponding	Severe: ponding	Severe: ponding	Severe: ponding	Severe: frost action low strength ponding	Severe: ponding
122B:						
Colp	Severe: wetness	Severe: shrink-swell	Severe: wetness	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
122B2:						
Colp	Severe: wetness	Severe: shrink-swell	Severe: wetness	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
122C3:						
Colp	Severe: wetness	Severe: shrink-swell	Severe: wetness	Severe: shrink-swell	Severe: low strength shrink-swell	Slight
122D3:						
Colp	Severe: wetness	Severe: shrink-swell	Severe: wetness	Severe: shrink-swell slope	Severe: low strength shrink-swell	Moderate: slope

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
287A:						
Chauncey--------	Severe: wetness	Severe: wetness	Severe: shrink-swell wetness	Severe: wetness	Severe: frost action wetness	Severe: wetness
301B:						
Grantsburg------	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: frost action low strength	Moderate: wetness
301C3:						
Grantsburg------	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell slope wetness	Severe: frost action low strength	Moderate: wetness
337A:						
Creal-----------	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action	Moderate: wetness
338A:						
Hurst-----------	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell	Moderate: wetness
340D3:						
Zanesville------	Moderate: slope wetness depth to rock	Moderate: slope wetness	Severe: slope wetness	Severe: slope	Severe: low strength slope	Moderate: slope
376A:						
Cisne, bench----	Severe: wetness	Severe: shrink-swell wetness	Severe: wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
377A:						
Hoyleton, bench	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: frost action low strength shrink-swell	Moderate: wetness
377B2:						
Hoyleton, bench	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: frost action low strength shrink-swell	Moderate: wetness
421G:						
Kell------------	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope
518B:						
Rend------------	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: frost action low strength	Slight
518B2:						
Rend------------	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: frost action low strength	Slight

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
518C2:						
Rend	Severe: wetness	Moderate: shrink-swell wetness	Severe: wetness	Moderate: shrink-swell wetness	Severe: frost action low strength	Slight
533. Urban land						
536. Dumps, mine						
583B:						
Pike	Slight	Slight	Slight	Slight	Severe: frost action low strength	Slight
583C2:						
Pike	Slight	Slight	Slight	Moderate: slope	Severe: frost action low strength	Slight
639A:						
Wynoose, bench	Severe: wetness	Severe: shrink-swell wetness	Severe: wetness	Severe: shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: wetness
640A:						
Bluford, bench	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: frost action low strength	Moderate: wetness
802B:						
Orthents, loamy	Moderate: wetness	Moderate: shrink-swell	Moderate: shrink-swell wetness	Moderate: shrink-swell	Severe: low strength	Slight
802F:						
Orthents, loamy	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: low strength slope	Severe: slope
823B:						
Schuline	Moderate: too clayey dense layer	Moderate: shrink-swell	Moderate: shrink-swell	Moderate: shrink-swell	Severe: low strength	Slight
866. Dumps, slurry						
871D:						
Lenzburg	Moderate: slope too clayey	Moderate: shrink-swell slope	Severe: shrink-swell slope	Severe: slope	Severe: low strength	Moderate: large stones slope
908F:						
Hickory	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: low strength slope	Severe: slope
Kell	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Severe: slope

Table 14.--Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
927D3:						
Blair	Severe: wetness	Moderate: shrink-swell slope wetness	Severe: wetness	Severe: slope	Severe: frost action low strength	Moderate: slope wetness
Atlas	Severe: wetness	Severe: shrink-swell wetness	Severe: shrink-swell wetness	Severe: shrink-swell slope wetness	Severe: low strength shrink-swell	Moderate: slope wetness droughty
1085A:						
Jacob	Severe: wetness	Severe: flooding shrink-swell wetness ponding	Severe: flooding shrink-swell wetness ponding	Severe: flooding shrink-swell wetness ponding	Severe: low strength shrink-swell wetness ponding	Severe: flooding too clayey wetness ponding
1108A:						
Bonnie	Severe: wetness	Severe: flooding wetness ponding	Severe: flooding wetness ponding	Severe: flooding wetness ponding	Severe: flooding low strength wetness ponding	Severe: flooding wetness ponding
3072A:						
Sharon	Moderate: flooding wetness	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding frost action	Severe: flooding
3085A:						
Jacob	Severe: wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: flooding too clayey wetness
3108A:						
Bonnie	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding low strength wetness	Severe: flooding wetness
3382A:						
Belknap	Severe: wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding frost action	Severe: flooding
3422A:						
Cape	Severe: wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: flooding shrink-swell wetness	Severe: low strength shrink-swell wetness	Severe: flooding wetness
W.						
Water						

Table 15.--Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2A:					
Cisne	Severe: percs slowly wetness	Slight	Severe: wetness	Severe: wetness	Poor: wetness
3A:					
Hoyleton	Severe: percs slowly wetness	Slight	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
3B2:					
Hoyleton	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
4B2:					
Richview	Moderate: percs slowly wetness	Moderate: seepage slope wetness	Severe: wetness	Moderate: wetness	Fair: too clayey
4C2:					
Richview	Moderate: percs slowly wetness	Severe: slope	Severe: wetness	Moderate: wetness	Fair: too clayey
5C3:					
Blair	Severe: percs slowly wetness	Severe: slope wetness	Severe: wetness	Severe: wetness	Fair: too clayey wetness
8D3:					
Hickory	Moderate: percs slowly slope	Severe: slope	Moderate: slope too clayey	Moderate: slope	Fair: slope small stones too clayey
10C:					
Plumfield	Severe: percs slowly wetness	Severe: slope	Severe: wetness	Moderate: wetness	Fair: too clayey wetness
10D:					
Plumfield	Severe: percs slowly wetness	Severe: slope	Severe: wetness	Moderate: slope wetness	Fair: slope too clayey wetness
12A:					
Wynoose	Severe: percs slowly wetness	Slight	Severe: wetness	Severe: wetness	Poor: wetness

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
13A:					
Bluford	Severe: percs slowly wetness	Slight	Severe: wetness	Severe: wetness	Poor: wetness
13B2:					
Bluford	Severe: percs slowly wetness	Moderate: slope	Severe: wetness	Severe: wetness	Poor: wetness
14B:					
Ava	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Moderate: wetness	Fair: too clayey wetness
14B2:					
Ava	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Moderate: wetness	Fair: too clayey wetness
14C2:					
Ava	Severe: percs slowly wetness	Severe: slope wetness	Severe: wetness	Moderate: wetness	Fair: too clayey wetness
15D3:					
Parke	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope	Fair: slope
84A:					
Okaw	Severe: percs slowly ponding	Severe: ponding	Severe: too clayey ponding	Severe: ponding	Poor: hard to pack too clayey ponding
109A:					
Racoon	Severe: percs slowly ponding	Severe: ponding	Severe: ponding	Severe: ponding	Poor: thin layer ponding
122B:					
Colp	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey
122B2:					
Colp	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey
122C3:					
Colp	Severe: percs slowly wetness	Severe: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey
122D3:					
Colp	Severe: percs slowly wetness	Severe: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
287A:					
Chauncey--------	Severe: percs slowly wetness	Moderate: seepage	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
301B:					
Grantsburg------	Severe: percs slowly wetness	Moderate: seepage slope	Severe: wetness	Moderate: wetness	Fair: too clayey wetness
301C3:					
Grantsburg------	Severe: percs slowly wetness	Severe: slope	Severe: wetness	Moderate: wetness	Fair: too clayey wetness
337A:					
Creal-----------	Severe: percs slowly wetness	Severe: wetness	Severe: wetness	Severe: wetness	Poor: wetness
338A:					
Hurst-----------	Severe: percs slowly wetness	Slight-----------	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
340D3:					
Zanesville------	Severe: percs slowly wetness	Severe: slope wetness	Severe: depth to rock	Moderate: slope wetness depth to rock	Fair: area reclaim slope too clayey
376A:					
Cisne, bench----	Severe: percs slowly wetness	Slight-----------	Severe: wetness	Severe: wetness	Poor: wetness
377A:					
Hoyleton, bench	Severe: percs slowly wetness	Slight-----------	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
377B2:					
Hoyleton, bench	Severe: percs slowly wetness	Moderate: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey wetness
421G:					
Kell------------	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Poor: slope small stones depth to rock
518B:					
Rend------------	Severe: percs slowly wetness	Moderate: seepage slope	Moderate: too clayey wetness	Moderate: wetness	Fair: too clayey wetness

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
518B2:					
Rend	Severe: percs slowly wetness	Moderate: seepage slope	Moderate: too clayey wetness	Moderate: wetness	Fair: too clayey wetness
518C2:					
Rend	Severe: percs slowly wetness	Severe: slope	Moderate: too clayey wetness	Moderate: wetness	Fair: too clayey wetness
533. Urban land					
536. Dumps, mine					
583B:					
Pike	Slight	Moderate: seepage slope	Severe: seepage	Slight	Fair: too clayey
583C2:					
Pike	Slight	Severe: slope	Severe: seepage	Slight	Fair: too clayey
639A:					
Wynoose, bench	Severe: percs slowly wetness	Slight	Severe: wetness	Severe: wetness	Poor: wetness
640A:					
Bluford, bench	Severe: percs slowly wetness	Slight	Severe: wetness	Severe: wetness	Poor: wetness
802B:					
Orthents, loamy	Severe: percs slowly	Moderate: slope wetness	Moderate: too clayey	Slight	Fair: too clayey
802F:					
Orthents, loamy	Severe: percs slowly slope	Severe: slope	Severe: slope	Severe: slope	Poor: slope
823B:					
Schuline	Severe: percs slowly	Moderate: slope	Moderate: too clayey	Slight	Fair: large stones too clayey
866. Dumps, slurry					
871D:					
Lenzburg	Severe: percs slowly	Severe: slope	Moderate: slope too clayey	Moderate: slope	Fair: slope small stones too clayey

Table 15.--Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
908F:					
Hickory	Severe: slope	Severe: slope	Severe: slope	Severe: slope	Poor: slope
Kell	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Severe: slope depth to rock	Poor: slope small stones depth to rock
927D3:					
Blair	Severe: percs slowly wetness	Severe: slope wetness	Severe: wetness	Severe: wetness	Fair: slope too clayey wetness
Atlas	Severe: percs slowly wetness	Severe: slope	Severe: too clayey wetness	Severe: wetness	Poor: hard to pack too clayey
1085A:					
Jacob	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness
1108A:					
Bonnie	Severe: flooding percs slowly ponding	Severe: flooding ponding	Severe: flooding ponding	Severe: flooding ponding	Poor: ponding
3072A:					
Sharon	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Fair: wetness
3085A:					
Jacob	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness
3108A:					
Bonnie	Severe: flooding percs slowly wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Poor: wetness
3382A:					
Belknap	Severe: flooding percs slowly wetness	Severe: flooding wetness	Severe: flooding wetness	Severe: flooding wetness	Poor: wetness
3422A:					
Cape	Severe: flooding percs slowly wetness	Severe: flooding	Severe: flooding too clayey wetness	Severe: flooding wetness	Poor: hard to pack too clayey wetness
W.					
Water					

Table 16.--Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
2A:				
Cisne	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
3A:				
Hoyleton	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
3B2:				
Hoyleton	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
4B2:				
Richview	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Good
4C2:				
Richview	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Good
5C3:				
Blair	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
8D3:				
Hickory	Fair: low strength	Improbable: excess fines	Improbable: excess fines	Poor: small stones
10C:				
Plumfield	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim
10D:				
Plumfield	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim
12A:				
Wynoose	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
13A:				
Bluford	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
13B2:				
Bluford	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
14B:				
Ava	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
14B2:				
Ava	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
14C2:				
Ava	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
15D3:				
Parke	Good	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
84A:				
Okaw	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
109A:				
Racoon	Poor: wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
122B:				
Colp	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
122B2:				
Colp	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
122C3:				
Colp	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
122D3:				
Colp	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
287A:				
Chauncey	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
301B:				
Grantsburg	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
301C3:				
Grantsburg	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
337A:				
Creal	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Good
338A:				
Hurst	Poor: low strength shrink-swell	Improbable: excess fines	Improbable: excess fines	Poor: too clayey

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
340D3:				
Zanesville------	Severe: low strength	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim
376A:				
Cisne, bench----	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
377A:				
Hoyleton, bench	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
377B2:				
Hoyleton, bench	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
421G:				
Kell------------	Poor: slope depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope small stones
518B:				
Rend------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
518B2:				
Rend------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
518C2:				
Rend------------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
533. Urban land				
536. Dumps, mine				
583B:				
Pike------------	Good------------------	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
583C2:				
Pike------------	Good------------------	Improbable: excess fines	Improbable: excess fines	Fair: too clayey
639A:				
Wynoose, bench--	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
640A:				
Bluford, bench--	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
802B:				
Orthents, loamy	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: small stones too clayey

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
802F:				
Orthents, loamy	Poor: low strength slope	Improbable: excess fines	Improbable: excess fines	Poor: slope
823B:				
Schuline--------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: small stones too clayey
866.				
Dumps, slurry				
871D:				
Lenzburg--------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: area reclaim small stones
908F:				
Hickory---------	Poor: slope	Improbable: excess fines	Improbable: excess fines	Poor: slope small stones
Kell------------	Poor: depth to rock	Improbable: excess fines	Improbable: excess fines	Poor: slope small stones
927D3:				
Blair-----------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Fair: slope small stones too clayey
Atlas-----------	Poor: low strength	Improbable: excess fines	Improbable: excess fines	Poor: too clayey
1085A:				
Jacob-----------	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
1108A:				
Bonnie----------	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
3072A:				
Sharon----------	Good------------------	Improbable: excess fines	Improbable: excess fines	Good
3085A:				
Jacob-----------	Poor: low strength shrink-swell wetness	Improbable: excess fines	Improbable: excess fines	Poor: too clayey wetness
3108A:				
Bonnie----------	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness

Table 16.--Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
3382A:				
Belknap---------	Fair: wetness	Improbable: excess fines	Improbable: excess fines	Good
3422A:				
Cape------------	Poor: low strength wetness	Improbable: excess fines	Improbable: excess fines	Poor: wetness
W.				
Water				

Table 17.--Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table)

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
2A: Cisne-----------	Slight--------	Severe: wetness	Severe: no water	Limitation: frost action percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
3A: Hoyleton--------	Slight: slope	Severe: thin layer wetness	Severe: slow refill	Limitation: frost action percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
3B2: Hoyleton--------	Moderate: slope	Severe: thin layer wetness	Severe: slow refill	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
4B2: Richview--------	Moderate: seepage slope	Slight--------	Moderate: slow refill deep to water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
4C2: Richview--------	Moderate: seepage slope	Slight--------	Moderate: slow refill deep to water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
5C3: Blair-----------	Moderate: slope	Severe: wetness	Severe: slow refill	Limitation: frost action slope	Limitation: erodes easily slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily
8D3: Hickory---------	Severe: slope	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
10C:							
Plumfield-------	Moderate: slope	Severe: piping	Severe: no water	Limitation: frost action percs slowly slope	Limitation: slope wetness droughty	Limitation: erodes easily wetness	Limitation: erodes easily droughty
10D:							
Plumfield-------	Severe: slope	Severe: piping	Severe: no water	Limitation: frost action percs slowly slope	Limitation: slope wetness droughty	Limitation: erodes easily slope wetness	Limitation: erodes easily slope droughty
12A:							
Wynoose---------	Slight--------	Severe: wetness	Severe: no water	Limitation: frost action percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
13A:							
Bluford---------	Slight--------	Severe: piping	Severe: no water	Limitation: frost action percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
13B2:							
Bluford---------	Moderate	Severe: piping	Severe: no water	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
14B:							
Ava-------------	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily rooting depth
14B2:							
Ava-------------	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily rooting depth

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
14C2:							
Ava------------	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily rooting depth
15D3:							
Parke-----------	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope
84A:							
Okaw------------	Slight--------	Severe: ponding	Severe: slow refill	Limitation: frost action percs slowly ponding	Limitation: percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily percs slowly wetness
109A:							
Racoon----------	Slight--------	Severe: piping ponding	Severe: slow refill	Limitation: frost action percs slowly ponding	Limitation: erodes easily percs slowly ponding	Limitation: erodes easily ponding	Limitation: erodes easily percs slowly wetness
122B:							
Colp------------	Moderate: slope	Moderate: hard to pack wetness	Severe: slow refill	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly
122B2:							
Colp------------	Moderate: slope	Moderate: hard to pack wetness	Severe: slow refill	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly
122C3:							
Colp------------	Moderate: slope	Moderate: hard to pack wetness	Severe: slow refill	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily percs slowly

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
122D3: Colp	Severe: slope	Moderate: hard to pack, wetness	Severe: slow refill	Limitation: frost action, percs slowly, slope	Limitation: percs slowly, slope, wetness	Limitation: erodes easily, slope, wetness	Limitation: erodes easily, percs slowly, slope
287A: Chauncey	Slight	Severe: wetness	Severe: no water	Limitation: frost action, percs slowly	Limitation: erodes easily, percs slowly, wetness	Limitation: erodes easily, percs slowly, wetness	Limitation: erodes easily, percs slowly, wetness
301B: Grantsburg	Moderate: seepage, slope	Moderate: piping, thin layer, wetness	Severe: no water	Limitation: frost action, percs slowly, slope	Limitation: percs slowly, slope, wetness	Limitation: erodes easily, wetness	Limitation: erodes easily, rooting depth
301C3: Grantsburg	Moderate: seepage, slope	Moderate: piping, thin layer, wetness	Severe: no water	Limitation: frost action, percs slowly, slope	Limitation: percs slowly, slope, wetness	Limitation: erodes easily, wetness	Limitation: erodes easily, rooting depth
337A: Creal	Slight	Severe: thin layer, wetness	Severe: slow refill	Limitation: frost action	Limitation: erodes easily, wetness	Limitation: erodes easily, wetness	Limitation: erodes easily, wetness
338A: Hurst	Slight	Severe: wetness	Severe: slow refill	Limitation: percs slowly	Limitation: percs slowly, wetness	Limitation: erodes easily, wetness	Limitation: erodes easily, wetness
340D3: Zanesville	Moderate: seepage, depth to rock	Severe: piping	Severe: no water	Limitation: percs slowly, slope	Limitation: percs slowly, rooting depth, wetness	Limitation: erodes easily, slope, wetness	Limitation: erodes easily, rooting depth, slope
376A: Cisne, bench	Slight	Severe: wetness	Severe: no water	Limitation: frost action, percs slowly	Limitation: erodes easily, percs slowly, wetness	Limitation: erodes easily, percs slowly, wetness	Limitation: erodes easily, percs slowly, wetness

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Limitations for-- Aquifer-fed excavated ponds	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
377A: Hoyleton, bench	Slight: slope	Severe: thin layer wetness	Severe: slow refill	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
377B2: Hoyleton, bench	Moderate: slope	Severe: thin layer wetness	Severe: slow refill	Limitation: frost action percs slowly slope	Limitation: percs slowly slope wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
421G: Kell------------	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
518B: Rend------------	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: frost action slope	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily
518B2: Rend------------	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: frost action slope	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily
518C2: Rend------------	Moderate: seepage slope	Severe: piping	Severe: no water	Limitation: frost action slope	Limitation: percs slowly slope wetness	Limitation: erodes easily wetness	Limitation: erodes easily
533. Urban land							
536. Dumps, mine							
583B: Pike------------	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
583C2:							
Pike------------	Moderate: seepage slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
639A:							
Wynoose, bench--	Slight--------	Severe: wetness	Severe: no water	Limitation: frost action percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
640A:							
Bluford, bench--	Slight--------	Severe: piping	Severe: no water	Limitation: frost action percs slowly	Limitation: percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness
802B:							
Orthents, loamy	Slight--------	Moderate: piping	Severe: slow refill	Limitation: deep to water	Limitation: erodes easily rooting depth	Limitation: erodes easily	Limitation: erodes easily rooting depth
802F:							
Orthents, loamy	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: erodes easily rooting depth slope	Limitation: erodes easily slope	Limitation: erodes easily rooting depth slope
823B:							
Schuline--------	Moderate: slope	Moderate: piping thin layer	Severe: no water	Limitation: deep to water	Limitation: percs slowly rooting depth slope	Limitation: erodes easily	Limitation: erodes easily rooting depth
866.							
Dumps, slurry							
871D:							
Lenzburg--------	Severe: slope	Moderate: piping	Severe: no water	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
908F:							
Hickory	Severe: slope	Moderate: thin layer	Severe: no water	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Kell	Severe: slope	Severe: piping	Severe: no water	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
927D3:							
Blair	Severe: slope	Severe: wetness	Severe: slow refill	Limitation: frost action slope	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness	Limitation: erodes easily slope
Atlas	Severe: slope	Severe: hard to pack	Severe: no water	Limitation: frost action percs slowly slope	Limitation: slope wetness droughty	Limitation: erodes easily slope wetness	Limitation: erodes easily slope wetness
1085A:							
Jacob	Slight	Severe: hard to pack wetness	Severe: no water	Limitation: flooding percs slowly ponding	Limitation: percs slowly slow intake wetness ponding	Limitation: percs slowly wetness ponding	Limitation: percs slowly wetness ponding
1108A:							
Bonnie	Slight	Severe: wetness	Severe: slow refill	Limitation: flooding frost action ponding	Limitation: erodes easily flooding wetness ponding	Limitation: erodes easily wetness ponding	Limitation: erodes easily wetness ponding
3072A:							
Sharon	Moderate: seepage	Severe: piping	Moderate: slow refill deep to water	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily
3085A:							
Jacob	Slight	Severe: hard to pack wetness	Severe: no water	Limitation: flooding percs slowly	Limitation: percs slowly slow intake wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness

Table 17.--Water Management--Continued

Map symbol and soil name	Limitations for--: Pond reservoir areas	Limitations for--: Embankments, dikes, and levees	Limitations for--: Aquifer-fed excavated ponds	Features affecting--: Drainage	Features affecting--: Irrigation	Features affecting--: Terraces and diversions	Features affecting--: Grassed waterways
3108A: Bonnie	Slight	Severe: wetness	Severe: slow refill	Limitation: flooding frost action	Limitation: erodes easily flooding wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
3382A: Belknap	Moderate: seepage	Severe: piping wetness	Severe: slow refill	Limitation: flooding frost action	Limitation: erodes easily wetness	Limitation: erodes easily wetness	Limitation: erodes easily wetness
3422A: Cape	Slight	Severe: hard to pack wetness	Severe: no water	Limitation: flooding frost action percs slowly	Limitation: percs slowly wetness	Limitation: percs slowly wetness	Limitation: percs slowly wetness
W. Water							

Table 18.--Engineering Index Properties

(Absence of an entry indicates that data were not estimated. The representative values for USDA texture and for Unified and AASHTO classifications are designated with an asterisk. Representative values are those that occur most commonly)

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
2A:												
Cisne-----------	0-8	Silt loam*	CL-ML*, CL, ML	A-4*	0	0	100	100	96-100	88-100	19-29	2-10
	8-17	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	95-100	88-99	19-29	3-11
	17-37	Silty clay loam*, silty clay.	CL*, CH	A-7*	0	0	100	100	98-100	92-99	40-57	19-33
	37-60	Silty clay loam*, silt loam, clay loam, loam.	CL*	A-6*, A-7	0	0	95-100	84-100	78-99	61-91	29-46	11-25
	60-80	Silt loam*, loam, clay loam, silty clay loam.	CL*	A-6*	0	0	95-100	82-97	72-96	52-89	30-46	12-25
3A:												
Hoyleton--------	0-8	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	96-100	85-100	21-37	5-18
	8-11	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	96-100	85-100	21-37	4-18
	11-39	Silty clay loam*, silty clay.	CH*, CL	A-7*	0	0	100	100	96-100	91-100	44-57	22-33
	39-80	Silt loam*, silty clay loam, clay loam, loam.	CL*	A-6*, A-4, A-7	0	0	100	95-100	84-100	60-97	28-46	10-25
3B2:												
Hoyleton--------	0-7	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	96-100	85-100	21-37	5-18
	7-39	Silty clay loam*, silty clay.	CH*, CL	A-7*	0	0	100	100	96-100	91-100	44-57	22-33
	39-80	Silt loam*, silty clay loam, clay loam, loam.	CL*	A-6*, A-4, A-7	0	0	100	95-100	84-100	60-97	28-46	10-25
4B2:												
Richview--------	0-9	Silt loam*	CL*	A-4*, A-6	0	0	100	100	95-100	90-100	28-39	8-17
	9-37	Silty clay loam*, silt loam.	CL*	A-7*, A-6	0	0	100	100	95-100	90-100	36-49	17-25
	37-73	Silt loam*, loam, clay loam.	CL*	A-6*, A-7	0	0	100	90-100	90-100	70-95	26-42	10-21

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
4C2:												
Richview--------	0-9	Silt loam*	CL*	A-4*, A-6	0	0	100	100	95-100	90-100	28-39	8-17
	9-36	Silty clay loam*, silt loam.	CL*	A-7*, A-6	0	0	100	100	95-100	90-100	36-49	17-25
	36-78	Silt loam*, loam, clay loam.	CL*	A-6*, A-7	0	0	100	90-100	90-100	70-95	26-42	10-21
5C3:												
Blair-----------	0-5	Silty clay loam*, silt loam.	CL*	A-6*	0	0-2	95-100	90-100	90-100	85-100	30-35	10-15
	5-12	Silty clay loam*, clay loam, silt loam.	CL*	A-6*, A-7	0	0-5	95-100	90-100	90-100	80-100	35-45	15-20
	12-71	Silt loam*, silty clay loam, clay loam.	CL*	A-6*, A-7	0	0-5	95-100	90-100	90-100	70-100	30-45	10-20
	71-80	Silt loam*, silty clay loam, clay loam.	CL*	A-6*	0	0-5	95-100	90-100	90-100	75-95	30-45	10-20
8D3:												
Hickory---------	0-8	Clay loam*	CL*	A-6*, A-7	0	0-5	95-100	90-100	80-95	70-85	35-45	15-25
	8-46	Clay loam*, loam, gravelly clay loam.	CL*	A-6*, A-7	0-1	0-5	95-100	75-100	70-95	65-80	35-45	15-25
	46-58	Clay loam*, loam	CL*	A-6*	0-1	0-5	85-100	70-95	70-95	60-80	25-40	10-20
	58-80	Loam*, sandy loam	CL*	A-6*, A-4	0-1	0-5	85-100	70-95	70-95	25-75	25-40	10-20
10C:												
Plumfield-------	0-5	Silty clay loam*	CL*	A-6*	0	0	100	100	95-100	90-100	30-40	10-20
	5-12	Silt loam*, silty clay loam.	CL*, CL-ML	A-6*	0	0	100	100	90-100	80-100	15-40	5-20
	12-36	Silt loam*, silty clay loam.	CL*, CL-ML	A-6*	0	0	100	95-100	90-100	80-100	15-40	5-20
	36-60	Silt loam*, silty clay loam, loam.	CL*, CL-ML	A-6*, A-4	0	0	100	95-100	90-100	75-100	15-40	4-20
10D:												
Plumfield-------	0-6	Silty clay loam*	CL*	A-6*	0	0	100	100	95-100	90-100	30-40	10-20
	6-21	Silt loam*, silty clay loam.	CL*, CL-ML	A-6*	0	0	100	100	90-100	80-100	15-40	5-20
	21-44	Silt loam*, silty clay loam.	CL*, CL-ML	A-6*	0	0	100	95-100	90-100	80-100	15-40	5-20
	44-60	Silt loam*, silty clay loam, loam.	CL*, CL-ML	A-6*, A-4	0	0	100	95-100	90-100	75-100	15-40	4-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
12A:												
Wynoose---------	0-7	Silt loam*	CL-ML*, CL	A-4*	0	0	100	100	94-100	86-98	19-29	2-10
	7-20	Silt loam*	CL-ML*, CL, ML	A-4*, A-6	0	0	100	100	94-100	86-98	19-29	2-11
	20-36	Silty clay*, silty clay loam.	CL*, CH	A-7*	0	0	100	100	97-100	92-100	45-54	23-30
	36-66	Silty clay loam*, clay loam, silt loam.	CL*	A-6*, A-7	0	0	98-100	92-100	88-98	68-88	35-46	15-25
	66-80	Silt loam*, silty clay loam, clay loam.	CL*	A-6*, A-7	0	0	98-100	87-100	84-98	68-88	35-46	15-25
13A:												
Bluford---------	0-7	Silt loam*	CL-ML*, CL	A-4*, A-6	0	0	100	100	96-100	89-98	20-35	5-15
	7-20	Silt loam*	CL*, CL-ML	A-4*	0	0	100	100	96-99	90-98	21-32	4-14
	20-35	Silty clay*, silty clay loam.	CH*, CL	A-7*	0	0	100	100	98-100	93-99	45-57	23-33
	35-60	Silty clay loam* silt loam, loam.	CL*	A-6*	0	0	100	98-100	90-98	72-88	29-46	11-25
13B2:												
Bluford---------	0-7	Silt loam*	CL-ML*, CL	A-4*, A-6	0	0	100	100	96-100	89-98	20-35	5-15
	7-27	Silty clay*, silty clay loam.	CH*, CL	A-7*	0	0	100	100	98-100	93-99	45-57	23-33
	27-80	Silty clay loam*, silt loam, loam.	CL*	A-6*	0	0	100	98-100	90-98	72-88	29-46	11-25
14B:												
Ava-------------	0-8	Silt loam*	CL-ML*, CL	A-4*, A-6	0	0	100	100	96-100	93-99	25-32	6-11
	8-18	Silt loam*	CL-ML*, CL	A-4*, A-6	0	0	100	100	96-100	93-99	25-32	6-12
	18-36	Silty clay loam*, silt loam.	CL*	A-6*	0	0	100	100	99-100	95-100	32-41	11-17
	36-53	Silt loam*, silty clay loam, loam, clay loam.	CL*, CL-ML	A-6*, A-4	0	0	100	93-100	87-100	69-88	25-35	6-15
	53-80	Loam*, silty clay loam, clay loam, silt loam.	CL*, CL-ML	A-6*, A-4	0	0	100	97-100	90-99	62-88	25-35	6-15

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
14B2:												
Ava-------------	0-9	Silt loam*	CL*	A-6*, A-4	0	0	100	100	95-100	90-100	27-40	10-18
	9-28	Silty clay loam*	CL*	A-6*, A-4	0	0	100	100	95-100	90-100	29-40	10-21
	28-64	Silty clay loam*, loam, clay loam.	CL*	A-6*, A-4	0	0	100	95-100	90-100	80-90	29-40	10-21
	64-78	Loam*, silt loam, clay loam.	CL*	A-6*, A-4	0	0	100	95-100	90-100	80-90	29-40	10-21
14C2:												
Ava-------------	0-9	Silt loam*	CL*	A-6*, A-4	0	0	100	100	95-100	90-100	27-40	10-18
	9-28	Silty clay loam*	CL*	A-6*	0	0	100	100	95-100	90-100	29-40	10-21
	28-64	Silty clay loam*, loam, clay loam.	CL*	A-6*, A-4	0	0	100	95-100	90-100	80-90	29-40	10-21
	64-78	Loam*, silt loam, clay loam.	CL*	A-6*, A-4	0	0	100	95-100	90-100	80-90	29-40	10-21
15D3:												
Parke-----------	0-9	Silty clay loam*	CL*	A-6*	0	0	100	100	95-100	85-95	30-40	10-15
	9-30	Silty clay loam*, silt loam.	CL*	A-6*, A-4	0	0	95-100	95-100	90-100	80-100	25-40	7-15
	30-78	Clay loam*, loam, sandy loam.	SC*, CL	A-6*, A-2, A-4	0	0-3	90-100	75-95	55-90	30-60	25-35	7-15
84A:												
Okaw------------	0-7	Silt loam*	CL*	A-6*	0	0	100	100	95-100	90-100	30-45	15-25
	7-15	Silt loam*, silty clay loam.	CL*	A-6*, A-7	0	0	100	100	95-100	90-100	30-45	10-25
	15-54	Silty clay*, clay	CH*	A-7*	0	0	100	100	95-100	85-100	55-75	35-50
	54-80	Stratified silty clay loam to silty clay*.	CH*	A-7*	0	0	100	100	95-100	85-100	50-70	30-45
109A:												
Racoon----------	0-7	Silt loam*	CL*	A-6*, A-4	0	0	100	100	95-100	90-100	30-35	10-15
	7-29	Silt loam*	CL*	A-6*, A-4	0	0	100	100	95-100	90-100	30-35	10-15
	29-41	Silty clay loam*	CL*	A-6*	0	0	100	100	95-100	90-100	35-45	15-20
	41-51	Silt loam*, silty clay loam.	CL*	A-6*	0	0	100	100	95-100	90-100	35-45	15-20
	51-80	Silt loam*, silty clay loam, loam.	CL*	A-6*, A-4	0	0	95-100	90-100	75-100	60-90	30-40	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
122B:												
Colp------------	0-7	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	7-13	Silty clay loam*, silt loam.	CL*	A-6*, A-4, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	13-45	Silty clay*, silty clay loam.	CL*, CH	A-7*, A-6	0	0	100	100	95-100	90-100	35-60	20-40
	45-60	Silty clay*, silty clay loam.	CL*, CH	A-7*, A-6	0	0	100	100	95-100	85-100	35-55	15-30
122B2:												
Colp------------	0-7	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	7-35	Silty clay*, silty clay loam.	CL*, CH	A-7*, A-6	0	0	100	100	95-100	90-100	35-60	20-40
	35-60	Silty clay*, silty clay loam.	CL*, CH	A-7*, A-6	0	0	100	100	95-100	85-100	35-55	15-30
122C3:												
Colp------------	0-7	Silty clay loam*, silt loam.	CL*	A-6*, A-4	0	0	100	100	95-100	90-100	30-45	10-20
	7-48	Silty clay*, silty clay loam.	CL*, CH	A-7*, A-6	0	0	100	100	95-100	90-100	35-60	20-40
	48-60	Silty clay*, silty clay loam.	CL*, CH	A-7*, A-6	0	0	100	100	95-100	85-100	35-55	15-30
122D3:												
Colp------------	0-5	Silty clay loam*	CL*	A-6*, A-4	0	0	100	100	95-100	90-100	30-45	10-20
	5-30	Silty clay*, silty clay loam.	CL*, CH	A-7*, A-6	0	0	100	100	95-100	90-100	35-60	20-40
	30-60	Silty clay*, silty clay loam.	CL*, CH	A-7*, A-6	0	0	100	100	95-100	85-100	35-55	15-30
287A:												
Chauncey--------	0-12	Silt loam*	CL*	A-6*, A-4	0	0	100	100	90-100	90-100	25-35	7-15
	12-26	Silt loam*	CL*, CL-ML	A-4*	0	0	100	100	90-100	90-100	20-30	5-10
	26-46	Silty clay*, silty clay loam.	CL*, CH	A-7*	0	0	100	100	90-100	90-100	40-55	20-35
	46-60	Silty clay loam*, silt loam.	CL*, ML	A-6*, A-7	0	0-5	95-100	95-100	90-100	80-95	35-45	10-20
301B:												
Grantsburg------	0-9	Silt loam*	CL*, ML	A-6*, A-4	0	0	100	100	100	90-100	30-40	7-15
	9-37	Silty clay loam*, silt loam.	CL*	A-7*, A-6	0	0	100	100	100	90-100	35-50	10-25
	37-61	Silt loam*, silty clay loam.	CL*	A-6*, A-7	0	0	100	100	100	90-100	30-45	7-15
	61-80	Silt loam*	CL*, ML	A-6*, A-4	0	0	100	100	90-100	85-100	30-40	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
301C3:												
Grantsburg------	0-5	Silty clay loam*	CL*	A-6*	0	0	100	100	100	90-100	30-40	10-20
	5-17	Silty clay loam*, silt loam.	CL*	A-7*, A-6	0	0	100	100	100	90-100	35-50	10-25
	17-47	Silt loam*, silty clay loam.	ML*	A-6*, A-7	0	0	100	100	100	90-100	30-45	7-15
	47-91	Silty clay loam*	CL*	A-6*, A-4	0	0	100	100	90-100	85-100	30-40	10-20
337A:												
Creal-----------	0-6	Silt loam*	ML*, CL	A-4*, A-6	0	0	100	100	95-100	85-100	30-40	5-15
	6-25	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	95-100	85-100	25-35	4-12
	25-37	Silty clay loam*	CL*	A-4*, A-6	0	0	100	100	95-100	90-100	40-50	10-41
	37-80	Silt loam*, silty clay loam.	CL*, ML	A-7*, A-6	0	0	100	100	90-100	80-100	30-41	11-15
338A:												
Hurst-----------	0-7	Silt loam*	CL*	A-6*	0	0	100	95-100	95-100	75-100	35-45	15-25
	7-12	Silt loam*, silty clay loam.	CL*	A-6*	0	0	100	100	95-100	90-100	35-45	15-25
	12-53	Silty clay*, clay, silty clay loam.	CH*	A-7*	0	0	100	100	95-100	90-100	50-70	30-45
	53-80	Silty clay loam*, silty clay.	CH*, CL	A-7*	0	0	100	100	90-100	85-100	45-60	25-35
340D3:												
Zanesville------	0-2	Silty clay loam*, silt loam.	CL*, CL-ML	A-4*, A-6	0	0	95-100	95-100	90-100	80-100	25-40	4-15
	2-19	Silty clay loam*, silt loam.	CL*, CL-ML	A-6*, A-4	0	0	95-100	95-100	90-100	80-100	25-40	5-20
	19-39	Silt loam*, silty clay loam.	CL*, CL-ML, ML	A-6*, A-4	0	0-3	90-100	85-100	80-100	60-100	20-40	2-20
	39-49	Gravelly loam*, clay loam, channery sandy clay loam.	CL*, GM, SC, SM	A-6*, A-4, A-2, A-1-b	0	0-10	65-100	50-100	40-100	20-85	20-40	2-20
	49-60	Weathered bedrock*.	---	---	---	---	---	---	---	---	---	---

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
376A:												
Cisne, bench----	0-8	Silt loam*	CL-ML*, CL	A-4*	0	0	100	100	96-100	88-100	19-29	2-10
	8-17	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	95-100	88-99	19-29	3-11
	17-37	Silty clay loam*, silty clay.	CL*, CH	A-7*	0	0	100	100	98-100	92-99	40-57	19-33
	37-60	Silty clay loam*, silt loam, clay loam, loam.	CL*	A-6*, A-7	0	0	95-100	84-100	78-99	61-91	29-46	11-25
	60-80	Silt loam*, loam, clay loam, silty clay loam.	CL*	A-6*	0	0	95-100	82-97	72-96	52-89	30-46	12-25
377A:												
Hoyleton, bench	0-8	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	96-100	85-100	21-37	5-18
	8-11	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	96-100	85-100	21-37	4-18
	11-39	Silty clay loam*, silty clay.	CH*, CL	A-7*	0	0	100	100	96-100	91-100	44-57	22-33
	39-80	Silt loam*, silty clay loam, clay loam, loam.	CL*	A-6*, A-7	0	0	100	95-100	84-100	60-97	28-46	10-25
377B2:												
Hoyleton, bench	0-7	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	96-100	85-100	21-37	5-18
	7-39	Silty clay loam*, silty clay.	CH*, CL	A-7*	0	0	100	100	96-100	91-100	44-57	22-33
	39-80	Silt loam*, silty clay loam, clay loam, loam.	CL*	A-6*, A-4, A-7	0	0	100	95-100	84-100	60-97	28-46	10-25
421G:												
Kell------------	0-3	Silt loam*	CL-ML*, ML	A-4*	0	0-1	95-100	80-100	75-95	60-90	20-35	2-10
	3-7	Silt loam*, loam	CL-ML*, ML	A-4*	0	0-1	95-100	80-100	75-95	60-90	20-35	2-10
	7-13	Silt loam*, loam, silty clay loam.	CL*, CL-ML	A-6*, A-4	0	0-1	90-100	75-100	65-90	50-85	25-40	4-18
	13-35	Very channery silty clay loam*, silty clay loam, sandy loam.	GM*, SM	A-4*	0-2	0-10	60-90	45-90	40-80	35-75	20-35	NP-10
	35-60	Weathered bedrock*.	---	---	---	---	---	---	---	---	---	---

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
518B:												
Rend------------	0-8	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	8-11	Silt loam*, silt loam.	CL*, CL-ML	A-6*	0	0	100	100	95-100	90-100	25-35	5-15
	11-23	Silty clay loam*	CL*	A-6*, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	23-77	Silt loam*, silty clay loam, clay loam.	CL*	A-6*, A-4	0	0	100	90-100	90-100	70-90	25-45	10-20
	77-80	Silt loam*, silty clay loam, clay loam.	CL*, CL-ML	A-6*, A-4	0	0	100	90-100	90-100	70-90	25-40	5-20
518B2:												
Rend------------	0-8	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	8-23	Silty clay loam*	CL*	A-6*, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	23-77	Silt loam*, silty clay loam, clay loam.	CL*	A-6*, A-4	0	0	100	90-100	90-100	70-90	25-45	10-20
	77-80	Silt loam*, silty clay loam, clay loam.	CL*, CL-ML	A-6*, A-4	0	0	100	90-100	90-100	70-90	25-40	5-20
518C2:												
Rend------------	0-8	Silt loam*	CL*, CL-ML	A-4*, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	8-23	Silty clay loam*	CL*	A-6*, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	23-77	Silt loam*, silty clay loam, clay loam.	CL*	A-6*, A-4	0	0	100	90-100	90-100	70-90	25-45	10-20
	77-80	Silt loam*, silty clay loam, clay loam.	CL*, CL-ML	A-6*, A-4	0	0	100	90-100	90-100	70-90	25-40	5-20
533. Urban land												
536. Dumps, mine												
583B:												
Pike------------	0-8	Silt loam*	CL*	A-6*, A-4	0	0	100	100	90-100	90-100	25-35	8-15
	8-38	Silty clay loam*	CL*	A-6*, A-7	0	0	100	100	90-100	90-100	30-45	10-25
	38-57	Silt loam*, silty clay loam.	CL*	A-6*	0	0	100	100	90-100	70-90	20-35	10-20
	57-99	Loam*, clay loam	CL*	A-4*, A-6	0	0	90-100	90-100	80-100	60-80	14-40	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
583C2:												
Pike------------	0-6	Silt loam*	CL*	A-6*, A-4	0	0	100	100	90-100	90-100	25-35	8-15
	6-38	Silty clay loam*	CL*	A-6*, A-7	0	0	100	100	90-100	90-100	30-45	10-25
	38-57	Silt loam*, silty clay loam.	CL*	A-6*	0	0	100	100	90-100	70-90	20-35	10-20
	57-99	Loam*, clay loam	CL*	A-4*, A-6	0	0	90-100	90-100	80-100	60-80	14-40	10-20
639A:												
Wynoose, bench--	0-7	Silt loam*	CL-ML*, CL	A-4*	0	0	100	100	94-100	86-98	19-29	2-10
	7-20	Silt loam*	CL-ML*, CL, ML	A-4*, A-6	0	0	100	100	94-100	86-98	19-29	2-11
	20-36	Silty clay*, silty clay loam.	CL*, CH	A-7*	0	0	100	100	97-100	92-100	45-54	23-30
	36-66	Silty clay loam*, clay loam, silt loam.	CL*	A-6*, A-7	0	0	98-100	92-100	88-98	68-88	35-46	15-25
	66-80	Silt loam*, silty clay loam, clay loam.	CL*	A-6*, A-7	0	0	98-100	87-100	84-98	68-88	35-46	15-25
640A:												
Bluford, bench--	0-7	Silt loam*	CL-ML*, CL	A-4*, A-6	0	0	100	100	96-100	89-98	20-35	5-15
	7-20	Silt loam*	CL*, CL-ML	A-4*	0	0	100	100	96-99	90-98	21-32	4-14
	20-35	Silty clay*, silty clay loam.	CH*, CL	A-7*	0	0	100	100	98-100	93-99	45-57	23-33
	35-60	Silty clay loam*, silt loam, loam.	CL*	A-6*	0	0	100	98-100	90-98	72-88	29-46	11-25
802B:												
Orthents, loamy	0-6	Loam*	CL*	A-6*	0	0-5	95-100	90-100	85-95	60-90	30-35	10-15
	6-60	Loam*, clay loam	CL*	A-6*	0	0-5	95-100	90-100	85-95	60-90	30-40	15-20
802F:												
Orthents, loamy	0-6	Loam*	CL*	A-6*	0	0-5	95-100	90-100	85-95	60-90	30-35	10-15
	6-60	Loam*, clay loam	CL*	A-6*	0	0-5	95-100	90-100	85-95	60-90	30-40	15-20
823B:												
Schuline--------	0-10	Silt loam*	CL*	A-6*, A-4	0	0	100	95-100	80-100	70-95	25-35	10-15
	10-60	Clay loam*, loam, silty clay loam.	CL*	A-6*, A-4, A-7	0-1	1-3	98-100	80-99	75-85	60-80	30-45	10-20
866.												
Dumps, slurry												

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
871D:												
Lenzburg--------	0-3	Gravelly silty clay loam*.	CL*	A-6*, A-7	0-3	3-15	80-95	75-90	65-90	50-85	35-45	15-25
	3-26	Clay loam*, silty clay loam, gravelly silty clay loam, gravelly loam.	CL*	A-6*, A-7	0-2	0-10	80-95	75-95	70-90	55-85	30-45	10-25
	26-60	Gravelly loam*, gravelly silty clay loam, gravelly clay loam.	CL*	A-6*, A-7	0-5	3-25	70-95	60-90	55-90	50-90	30-45	10-25
908F:												
Hickory---------	0-3	Silt loam*	CL-ML*, CL, ML	A-4*	0	0	90-100	90-100	90-100	75-95	22-28	3-8
	3-16	Silt loam*	CL-ML*, CL, ML	A-4*	0	0	90-100	90-100	90-100	75-95	22-28	3-8
	16-43	Clay loam*, loam	CL*	A-6*	0	0-2	85-100	75-95	70-95	60-80	32-39	11-18
	43-60	Loam*, clay loam	CL*, CL-ML	A-6*, A-4	0	0-2	85-100	75-95	70-95	60-80	22-34	4-14
Kell------------	0-3	Silt loam*	CL-ML*, ML	A-4*	0	0-1	95-100	80-100	75-95	60-90	20-35	2-10
	3-7	Silt loam*, loam	CL-ML*, ML	A-4*	0	0-1	95-100	80-100	75-95	60-90	20-35	2-10
	7-13	Silt loam*, loam, silty clay loam.	CL*, CL-ML	A-6*, A-4	0	0-1	90-100	75-100	65-90	50-85	25-40	4-18
	13-35	Very channery silty clay loam*, silty clay loam, sandy loam.	ML*, GM, SM	A-4*	0-2	0-10	60-90	45-90	40-80	35-75	20-35	NP-10
	35-60	Weathered bedrock*.	---	---	---	---	---	---	---	---	---	---
927D3:												
Blair-----------	0-5	Silty clay loam*	CL*	A-6*	0	0-2	95-100	90-100	90-100	85-100	30-35	10-15
	5-12	Silty clay loam*, clay loam, silt loam.	CL*	A-6*, A-7	0	0-5	95-100	90-100	90-100	80-100	35-45	15-20
	12-71	Silt loam*, silty clay loam, clay loam.	CL*	A-6*, A-7	0	0-5	95-100	90-100	90-100	70-100	30-45	10-20
	71-80	Silt loam*, silty clay loam, clay loam.	CL*	A-6*	0	0-5	95-100	90-100	90-100	75-95	30-45	10-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments: >10 inches	Fragments: 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
927D3:												
Atlas-----------	0-8	Silty clay loam*	CH*, CL	A-7*	0	0	100	100	90-100	65-95	45-55	25-35
	8-43	Clay loam*, silty clay, silty clay loam.	CH*	A-7*	0	0	100	95-100	90-100	65-90	45-65	25-40
	43-60	Silty clay loam*, clay loam, loam.	CH*	A-7*	0	0	100	95-100	90-100	65-90	40-60	20-35
1085A:												
Jacob-----------	0-9	Silty clay*	CH*, MH	A-7*	0	0	100	100	95-100	95-100	60-85	33-45
	9-60	Clay*, silty clay	MH*	A-7*	0	0	100	100	95-100	95-100	65-85	30-45
	60-80	Clay*, silty clay	MH*	A-7*	0	0	100	100	95-100	95-100	65-85	30-45
1108A:												
Bonnie----------	0-8	Silt loam*	CL*	A-4*, A-6	0	0	100	100	95-100	90-100	27-34	8-12
	8-37	Silt loam*	CL*	A-4*, A-6	0	0	100	100	95-100	90-100	27-34	8-12
	37-70	Silty clay loam*, silt loam.	CL*	A-6*, A-4	0	0	100	100	90-100	85-100	25-39	8-15
3072A:												
Sharon----------	0-25	Silt loam*	CL-ML*, CL, ML	A-4*	0	0	100	100	95-100	85-95	20-30	2-10
	25-80	Silt loam*, loam, sandy loam.	CL-ML*, CL, ML, SC, SM	A-4*	0	0	100	100	70-95	40-90	15-30	NP-10
3085A:												
Jacob-----------	0-9	Silty clay*	CH*, MH	A-7*	0	0	100	100	95-100	95-100	60-85	33-45
	9-60	Clay*, silty clay	MH*	A-7*	0	0	100	100	95-100	95-100	65-85	30-45
	60-80	Clay*, silty clay	MH*	A-7*	0	0	100	100	95-100	95-100	65-85	30-45
3108A:												
Bonnie----------	0-8	Silt loam*	CL*	A-4*, A-6	0	0	100	100	95-100	90-100	27-34	8-12
	8-37	Silt loam*	CL*	A-4*, A-6	0	0	100	100	95-100	90-100	27-34	8-12
	37-70	Silty clay loam*, silt loam.	CL*	A-6*, A-4	0	0	100	100	90-100	85-100	25-39	8-15
3382A:												
Belknap---------	0-7	Silt loam*	CL-ML*, ML, CL	A-4*	0	0	100	95-100	95-100	80-100	20-30	2-8
	7-26	Silt loam*	CL-ML*, ML, CL	A-4*, A-6	0	0	100	95-100	95-100	80-100	20-35	NP-12
	26-65	Silt loam*, silty clay loam.	CL*, CL-ML, ML	A-6*, A-4	0	0	100	95-100	95-100	75-100	20-40	3-20

Table 18.--Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
3422A:												
Cape------------	0-10	Silty clay loam*	CL*	A-7*, A-6	0	0	100	100	100	95-100	35-50	20-30
	10-22	Silty clay loam*, silty clay.	CL*	A-7*	0	0	100	100	100	95-100	35-50	20-30
	22-80	Silty clay*, clay	CH*, CL	A-7*, A-6	0	0	100	100	100	90-100	39-70	30-45
W.												
Water												

Table 19.--Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors K	Kf	T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	in/hr	In/in	Pct					
2A:											
Cisne-----------	0-8	10-20	1.30-1.50	0.60-2.00	0.21-0.25	0.0-2.9	.32	.32	3	5	56
	8-17	10-20	1.40-1.60	0.20-0.60	0.20-0.24	0.0-2.9	.55	.55			
	17-37	35-45	1.30-1.50	0.01-0.06	0.13-0.17	6.0-8.9	.37	.37			
	37-60	20-35	1.50-1.70	0.06-0.20	0.12-0.16	3.0-5.9	.37	.37			
	60-80	20-35	1.50-1.70	0.06-0.20	0.12-0.16	3.0-5.9	.43	.43			
3A:											
Hoyleton--------	0-8	10-27	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32	3	5	56
	8-11	12-27	1.30-1.50	0.60-2.00	0.17-0.21	0.0-2.9	.49	.49			
	11-39	35-47	1.30-1.60	0.06-0.20	0.12-0.16	6.0-8.9	.37	.37			
	39-80	19-35	1.40-1.60	0.06-0.20	0.15-0.18	3.0-5.9	.43	.43			
3B2:											
Hoyleton--------	0-7	10-27	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32	3	5	56
	7-39	35-47	1.30-1.60	0.06-0.20	0.12-0.16	6.0-8.9	.37	.37			
	39-80	19-35	1.40-1.60	0.06-0.20	0.15-0.18	3.0-5.9	.43	.43			
4B2:											
Richview--------	0-9	17-25	1.20-1.40	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	5	5	56
	9-37	25-35	1.30-1.50	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37			
	37-73	15-35	1.40-1.70	0.60-2.00	0.14-0.20	3.0-5.9	.43	.43			
4C2:											
Richview--------	0-9	17-25	1.20-1.40	0.60-2.00	0.22-0.24	0.0-2.9	.32	.32	5	5	56
	9-36	25-35	1.30-1.50	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37			
	36-78	15-35	1.40-1.70	0.60-2.00	0.14-0.20	3.0-5.9	.43	.43			
5C3:											
Blair-----------	0-5	25-35	1.30-1.55	0.60-2.00	0.15-0.24	0.0-2.9	.37	.37	4	6	48
	5-12	25-35	1.45-1.60	0.20-0.60	0.16-0.21	3.0-5.9	.37	.37			
	12-71	18-35	1.45-1.60	0.20-0.60	0.16-0.21	3.0-5.9	.37	.37			
	71-80	15-35	1.35-1.70	0.20-0.60	0.19-0.22	3.0-5.9	.37	.37			
8D3:											
Hickory---------	0-8	27-35	1.40-1.65	0.60-2.00	0.17-0.19	3.0-5.9	.20	.24	4	6	48
	8-46	24-35	1.45-1.65	0.60-2.00	0.15-0.19	3.0-5.9	.28	.32			
	46-58	15-32	1.50-1.70	0.60-2.00	0.11-0.19	0.0-2.9	.28	.32			
	58-80	15-30	1.50-1.75	0.60-2.00	0.10-0.15	0.0-2.9	.28	.32			
10C:											
Plumfield-------	0-5	27-35	1.40-1.60	0.20-0.60	0.18-0.21	3.0-5.9	.43	.43	2	7	38
	5-12	20-30	1.65-1.90	0.01-0.06	0.09-0.11	0.0-2.9	.43	.43			
	12-36	20-30	1.65-1.90	0.01-0.06	0.09-0.11	0.0-2.9	.43	.43			
	36-60	20-35	1.55-1.75	0.20-0.60	0.05-0.08	0.0-2.9	.43	.43			
10D:											
Plumfield-------	0-6	27-35	1.40-1.60	0.20-0.60	0.18-0.21	3.0-5.9	.43	.43	2	7	38
	6-21	20-30	1.65-1.90	0.01-0.06	0.09-0.11	0.0-2.9	.43	.43			
	21-44	20-30	1.65-1.90	0.01-0.06	0.09-0.11	0.0-2.9	.43	.43			
	44-60	20-30	1.55-1.75	0.20-0.60	0.05-0.08	0.0-2.9	.43	.43			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Erosion factors K	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	in/hr	In/in	Pct					
12A:											
Wynoose---------	0-7	10-20	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43	3	5	56
	7-20	10-20	1.30-1.50	0.20-0.60	0.20-0.24	0.0-2.9	.55	.55			
	20-36	35-42	1.30-1.50	0.01-0.06	0.12-0.16	6.0-8.9	.37	.37			
	36-66	25-35	1.50-1.70	0.20-0.60	0.12-0.16	3.0-5.9	.37	.37			
	66-80	20-35	1.50-1.70	0.20-0.60	0.12-0.16	3.0-5.9	.43	.43			
13A:											
Bluford---------	0-7	10-18	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43	3	5	56
	7-20	10-25	1.35-1.61	0.20-0.60	0.20-0.24	0.0-2.9	.49	.49			
	20-35	35-45	1.30-1.50	0.06-0.20	0.13-0.17	6.0-8.9	.37	.37			
	35-60	20-35	1.50-1.75	0.06-0.20	0.11-0.19	3.0-5.9	.37	.37			
13B2:											
Bluford---------	0-7	10-18	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43	3	5	56
	7-27	35-45	1.30-1.50	0.06-0.20	0.13-0.17	6.0-8.9	.37	.37			
	27-80	20-35	1.50-1.75	0.06-0.20	0.11-0.19	3.0-5.9	.37	.37			
14B:											
Ava-------------	0-8	12-20	1.35-1.55	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43	4	5	56
	8-18	12-20	1.35-1.55	0.20-0.60	0.20-0.24	0.0-2.9	.49	.49			
	18-36	25-35	1.35-1.55	0.06-0.60	0.17-0.21	3.0-5.9	.37	.37			
	36-53	20-30	1.55-1.75	0.01-0.06	0.09-0.17	0.0-2.9	.43	.43			
	53-80	19-30	1.55-1.75	0.06-0.20	0.15-0.19	0.0-2.9	.43	.43			
14B2:											
Ava-------------	0-9	13-26	1.40-1.60	0.60-2.00	0.21-0.24	0.0-2.9	.43	.43	4	5	56
	9-28	27-34	1.40-1.60	0.20-0.60	0.21-0.24	2.9-5.9	.37	.37			
	28-64	17-30	1.55-1.80	0.01-0.06	0.09-0.11	0.0-2.9	.43	.43			
	64-78	20-30	1.55-1.75	0.06-0.20	0.05-0.10	0.0-2.9	.43	.43			
14C2:											
Ava-------------	0-9	13-26	1.40-1.60	0.60-2.00	0.21-0.24	0.0-2.9	.43	.43	4	5	56
	9-28	27-34	1.40-1.60	0.20-0.60	0.21-0.24	2.9-5.9	.37	.37			
	28-64	17-30	1.55-1.80	0.01-0.06	0.09-0.11	0.0-2.9	.43	.43			
	64-78	20-30	1.55-1.75	0.06-0.20	0.05-0.10	0.0-2.9	.43	.43			
15D3:											
Parke-----------	0-9	24-32	1.30-1.45	0.60-2.00	0.20-0.23	3.0-5.9	.37	.37	4	7	38
	9-30	25-35	1.30-1.45	0.60-2.00	0.18-0.20	3.0-5.9	.37	.37			
	30-78	15-28	1.55-1.65	0.60-2.00	0.16-0.18	0.0-2.9	.28	.32			
84A:											
Okaw------------	0-7	15-27	1.20-1.40	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	3	6	48
	7-15	12-30	1.35-1.60	0.20-0.60	0.18-0.20	0.0-2.9	.49	.49			
	15-54	40-60	1.45-1.70	0.01-0.06	0.09-0.18	6.0-8.9	.32	.32			
	54-80	35-55	1.45-1.70	0.01-0.06	0.08-0.20	6.0-8.9	.37	.37			
109A:											
Racoon----------	0-7	18-27	1.30-1.50	0.20-0.60	0.22-0.24	0.0-2.9	.43	.43	5	5	56
	7-29	18-27	1.35-1.55	0.20-0.60	0.20-0.22	0.0-2.9	.49	.49			
	29-41	27-35	1.35-1.60	0.06-0.20	0.15-0.20	3.0-5.9	.37	.37			
	41-51	24-35	1.35-1.60	0.06-0.20	0.18-0.20	3.0-5.9	.37	.37			
	51-80	18-30	1.40-1.65	0.20-0.60	0.15-0.20	3.0-5.9	.49	.43			
122B:											
Colp------------	0-7	20-27	1.30-1.50	0.20-0.60	0.21-0.25	0.0-2.9	.43	.43	4	6	48
	7-13	20-30	1.30-1.50	0.20-0.60	0.15-0.20	0.0-2.9	.43	.43			
	13-45	35-50	1.45-1.70	0.06-0.20	0.10-0.17	6.0-8.9	.32	.32			
	45-60	30-45	1.50-1.70	0.06-0.20	0.10-0.18	6.0-8.9	.32	.32			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea-bility (Ksat)	Available water capacity	Linear extensi-bility	Erosion factors K	Kf	T	Wind erodi-bility group	Wind erodi-bility index
	In	Pct	g/cc	in/hr	In/in	Pct					
122B2:											
Colp------------	0-7	20-27	1.30-1.50	0.20-0.60	0.21-0.25	0.0-2.9	.43	.43	4	6	48
	7-35	35-50	1.45-1.70	0.06-0.20	0.10-0.17	6.0-8.9	.32	.32			
	35-60	30-45	1.50-1.70	0.06-0.20	0.10-0.18	6.0-8.9	.32	.32			
122C3:											
Colp------------	0-7	27-35	1.35-1.55	0.20-0.60	0.14-0.19	3.0-5.9	.37	.37	3	7	38
	7-48	35-50	1.45-1.70	0.06-0.20	0.10-0.17	6.0-8.9	.32	.32			
	48-60	30-45	1.50-1.70	0.06-0.20	0.10-0.18	6.0-8.9	.32	.32			
122D3:											
Colp------------	0-5	27-35	1.35-1.55	0.20-0.60	0.14-0.19	3.0-5.9	.37	.37	3	7	38
	5-30	35-50	1.45-1.70	0.06-0.20	0.10-0.17	6.0-8.9	.32	.32			
	30-60	30-45	1.50-1.70	0.06-0.20	0.10-0.18	6.0-8.9	.32	.32			
287A:											
Chauncey--------	0-12	15-22	1.30-1.50	0.60-2.00	0.22-0.25	0.0-2.9	.32	.32	5	5	56
	12-26	15-22	1.25-1.50	0.20-0.60	0.20-0.22	0.0-2.9	.43	.43			
	26-46	35-45	1.35-1.60	0.06-0.20	0.11-0.15	6.0-8.9	.37	.37			
	46-60	22-35	1.50-1.70	0.06-0.20	0.14-0.18	3.0-5.9	.37	.37			
301B:											
Grantsburg------	0-9	12-25	1.30-1.60	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43	4	5	56
	9-37	25-39	1.50-1.70	0.20-0.60	0.06-0.08	3.0-5.9	.37	.37			
	37-61	20-32	1.55-1.80	0.00-0.06	0.08-0.10	0.0-2.9	.43	.43			
	61-80	20-33	1.50-1.70	0.06-0.20	0.18-0.20	3.0-5.9	.43	.43			
301C3:											
Grantsburg------	0-5	20-32	1.50-1.70	0.20-0.60	0.18-0.20	3.0-5.9	.43	.43	3	7	38
	5-17	25-39	1.50-1.70	0.20-0.60	0.06-0.08	3.0-5.9	.37	.37			
	17-47	20-32	1.55-1.80	0.01-0.06	0.08-0.10	0.0-2.9	.43	.43			
	47-91	20-33	1.50-1.70	0.06-0.20	0.18-0.20	3.0-5.9	.37	.37			
337A:											
Creal-----------	0-6	18-27	1.30-1.50	0.20-0.60	0.22-0.24	0.0-2.9	.43	.43	5	6	48
	6-25	18-25	1.35-1.60	0.20-0.60	0.18-0.20	0.0-2.9	.49	.49			
	25-37	28-35	1.35-1.60	0.20-0.60	0.18-0.20	2.9-5.9	.37	.37			
	37-80	25-35	1.35-1.60	0.20-0.60	0.18-0.20	0.0-2.9	.43	.43			
338A:											
Hurst-----------	0-7	20-27	1.25-1.45	0.20-0.60	0.22-0.24	0.0-2.9	.43	.43	3	6	48
	7-12	18-30	1.30-1.50	0.20-0.60	0.20-0.22	0.0-2.9	.49	.49			
	12-53	35-60	1.45-1.70	0.01-0.06	0.10-0.17	6.0-8.9	.32	.32			
	53-80	27-45	1.50-1.70	0.00-0.06	0.10-0.18	6.0-8.9	.37	.37			
340D3:											
Zanesville------	0-2	12-35	1.35-1.40	0.60-2.00	0.19-0.23	0.0-2.9	.43	.43	3	7	38
	2-19	25-35	1.35-1.45	0.60-2.00	0.17-0.22	0.0-2.9	.37	.37			
	19-39	18-33	1.50-1.75	0.06-0.20	0.05-0.10	0.0-2.9	.43	.43			
	39-49	15-40	1.50-1.70	0.20-0.60	0.05-0.10	0.0-2.9	.28	.32			
	49-60	---	---	0.00-0.20	---	---	---	---			
376A:											
Cisne, bench----	0-8	10-20	1.30-1.50	0.60-2.00	0.21-0.25	0.0-2.9	.32	.32	3	5	56
	8-17	10-20	1.40-1.60	0.20-0.60	0.20-0.24	0.0-2.9	.55	.55			
	17-37	35-45	1.30-1.50	0.00-0.06	0.13-0.17	6.0-8.9	.37	.37			
	37-60	20-35	1.50-1.70	0.06-0.20	0.12-0.16	3.0-5.9	.37	.37			
	60-80	20-35	1.50-1.70	0.06-0.20	0.12-0.16	3.0-5.9	.43	.43			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability (Ksat)	Available water capacity	Linear extensibility	Erosion factors K	Kf	T	Wind erodibility group	Wind erodibility index
	In	Pct	g/cc	in/hr	In/in	Pct					
377A:											
Hoyleton, bench	0-8	10-27	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32	3	5	56
	8-11	12-27	1.30-1.50	0.60-2.00	0.17-0.21	0.0-2.9	.49	.49			
	11-39	35-47	1.30-1.60	0.06-0.20	0.12-0.16	6.0-8.9	.37	.37			
	39-80	19-35	1.40-1.60	0.06-0.20	0.15-0.18	3.0-5.9	.43	.43			
377B2:											
Hoyleton, bench	0-7	10-27	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	.32	.32	3	5	56
	7-39	35-47	1.30-1.60	0.06-0.20	0.12-0.16	6.0-8.9	.37	.37			
	39-80	19-35	1.40-1.60	0.06-0.20	0.15-0.18	0.0-5.9	.43	.43			
421G:											
Kell------------	0-3	15-27	1.25-1.35	0.60-2.00	0.18-0.22	0.0-2.9	.32	.32	3	5	56
	3-7	15-27	1.25-1.40	0.60-2.00	0.18-0.20	0.0-2.9	.37	.37			
	7-13	22-35	1.35-1.50	0.60-2.00	0.15-0.18	0.0-2.9	.32	.32			
	13-35	10-40	1.40-1.55	0.60-2.00	0.10-0.15	3.0-5.9	.28	.32			
	35-60	---	---	0.00-2.00	---	---	---	---			
518B:											
Rend------------	0-8	18-27	1.40-1.60	0.60-2.00	0.21-0.24	0.0-2.9	.43	.43	4	6	48
	8-11	18-27	1.40-1.60	0.60-2.00	0.21-0.24	0.0-2.9	.55	.55			
	11-23	27-35	1.40-1.60	0.60-2.00	0.18-0.21	3.0-5.9	.37	.37			
	23-77	20-30	1.50-1.70	0.01-0.06	0.09-0.11	0.0-2.9	.43	.43			
	77-80	20-30	1.55-1.75	0.20-0.60	0.05-0.10	0.0-2.9	.43	.43			
518B2:											
Rend------------	0-8	18-27	1.40-1.60	0.60-2.00	0.21-0.24	0.0-2.9	.43	.43	4	6	48
	8-23	27-35	1.40-1.60	0.60-2.00	0.18-0.21	3.0-5.9	.37	.37			
	23-77	20-30	1.50-1.70	0.01-0.06	0.09-0.11	0.0-2.9	.43	.43			
	77-80	20-30	1.55-1.75	0.20-0.60	0.05-0.10	0.0-2.9	.43	.43			
518C2:											
Rend------------	0-8	18-27	1.40-1.60	0.60-2.00	0.21-0.24	0.0-2.9	.43	.43	4	6	48
	8-23	27-35	1.40-1.60	0.60-2.00	0.18-0.21	3.0-5.9	.37	.37			
	23-77	20-30	1.50-1.70	0.01-0.06	0.09-0.11	0.0-2.9	.43	.43			
	77-80	20-30	1.55-1.75	0.20-0.60	0.05-0.10	0.0-2.9	.43	.43			
533.											
Urban land											
536.											
Dumps, mine											
583B:											
Pike------------	0-8	15-27	1.25-1.40	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	5	6	48
	8-38	27-35	1.30-1.45	0.60-2.00	0.18-0.22	0.0-2.9	.37	.37			
	38-57	15-30	1.30-1.60	0.60-2.00	0.12-0.18	0.0-2.9	.43	.43			
	57-99	15-30	1.45-1.70	0.60-2.00	0.08-0.19	0.0-2.9	.43	.43			
583C2:											
Pike------------	0-6	15-27	1.25-1.40	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	5	6	48
	6-38	27-35	1.30-1.45	0.60-2.00	0.18-0.22	0.0-2.9	.37	.37			
	38-57	15-30	1.30-1.60	0.60-2.00	0.12-0.18	0.0-2.9	.43	.43			
	57-99	15-30	1.45-1.70	0.60-2.00	0.08-0.19	0.0-2.9	.43	.43			
639A:											
Wynoose, bench--	0-7	10-20	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43	3	5	56
	7-20	10-20	1.30-1.50	0.20-0.60	0.20-0.24	0.0-2.9	.55	.55			
	20-36	35-42	1.30-1.50	0.01-0.06	0.12-0.16	6.0-8.9	.32	.32			
	36-66	25-35	1.50-1.70	0.20-0.60	0.12-0.16	3.0-5.9	.37	.37			
	66-80	20-35	1.50-1.70	0.20-0.60	0.12-0.16	3.0-5.9	.37	.37			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	in/hr	In/in	Pct					
640A:											
Bluford, bench--	0-7	10-18	1.30-1.50	0.60-2.00	0.20-0.24	0.0-2.9	.43	.43	3	5	56
	7-20	10-25	1.35-1.61	0.20-0.60	0.20-0.24	0.0-2.9	.49	.49			
	20-35	35-45	1.30-1.50	0.06-0.20	0.13-0.17	6.0-8.9	.37	.37			
	35-60	20-35	1.50-1.75	0.06-0.20	0.11-0.19	3.0-5.9	.37	.37			
802B:											
Orthents, loamy	0-6	18-27	1.70-1.75	0.20-0.60	0.18-0.22	3.0-5.9	.32	.32	5	4	86
	6-60	22-30	1.70-1.80	0.20-0.60	0.16-0.20	3.0-5.9	.32	.32			
802F:											
Orthents, loamy	0-6	18-27	1.70-1.75	0.20-0.60	0.18-0.22	3.0-5.9	.32	.32	5	4	86
	6-60	18-30	1.70-1.80	0.20-0.60	0.16-0.20	3.0-5.9	.32	.32			
823B:											
Schuline--------	0-10	15-27	1.30-1.50	0.60-2.00	0.20-0.23	0.0-2.9	.32	.32	5	5	56
	10-60	20-40	1.40-1.70	0.20-0.60	0.15-0.21	3.0-5.9	.43	.43			
866.											
Dumps, slurry											
871D:											
Lenzburg--------	0-3	27-35	1.30-1.60	0.60-2.00	0.08-0.14	3.0-5.9	.28	.32	5	8	0
	3-26	18-35	1.30-1.70	0.20-0.60	0.07-0.12	3.0-5.9	.37	.43			
	26-60	18-35	1.40-1.70	0.20-0.60	0.07-0.12	3.0-5.9	.37	.43			
908F:											
Hickory---------	0-3	10-20	1.30-1.50	0.60-2.00	0.20-0.22	0.0-2.9	.32	.32	5	5	56
	3-16	10-20	1.30-1.50	0.60-2.00	0.20-0.22	0.0-2.9	.37	.37			
	16-43	25-35	1.50-1.70	0.60-2.00	0.15-0.19	3.0-5.9	.24	.24			
	43-60	10-28	1.55-1.75	0.60-2.00	0.11-0.19	0.0-2.9	.32	.32			
Kell------------	0-3	15-27	1.25-1.35	0.60-2.00	0.18-0.22	0.0-2.9	.32	.32	3	5	56
	3-7	15-27	1.25-1.40	0.60-2.00	0.18-0.20	0.0-2.9	.37	.37			
	7-13	22-35	1.35-1.50	0.60-2.00	0.15-0.18	0.0-2.9	.32	.32			
	13-35	10-40	1.40-1.55	0.60-2.00	0.10-0.15	3.0-5.9	.28	.32			
	35-60	---	---	0.00-2.00	---	---	---	---			
927D3:											
Blair-----------	0-5	25-35	1.30-1.55	0.60-2.00	0.15-0.24	0.0-2.9	.37	.37	4	7	38
	5-12	25-35	1.45-1.60	0.20-0.60	0.16-0.21	3.0-5.9	.37	.37			
	12-71	18-35	1.45-1.60	0.20-0.60	0.16-0.21	3.0-5.9	.37	.37			
	71-80	15-35	1.35-1.70	0.20-0.60	0.19-0.22	3.0-5.9	.37	.37			
Atlas-----------	0-8	27-35	1.40-1.60	0.06-0.20	0.14-0.19	3.0-5.9	.28	.28	2	7	38
	8-43	30-45	1.55-1.75	0.01-0.06	0.07-0.19	6.0-8.9	.32	.32			
	43-60	25-45	1.55-1.75	0.01-0.06	0.07-0.19	6.0-8.9	.32	.32			
1085A:											
Jacob-----------	0-9	40-70	1.30-1.50	0.06-0.20	0.11-0.13	9.0-25.0	.24	.24	5	4	86
	9-60	60-75	1.35-1.45	0.01-0.06	0.10-0.13	9.0-25.0	.28	.28			
	60-80	60-75	1.35-1.45	0.01-0.06	0.10-0.13	9.0-25.0	.28	.28			
1108A:											
Bonnie----------	0-8	18-27	1.30-1.50	0.60-2.00	0.22-0.25	0.0-2.9	.37	.37	5	6	48
	8-37	18-27	1.40-1.60	0.20-0.60	0.21-0.24	0.0-2.9	.49	.49			
	37-70	18-30	1.40-1.60	0.20-0.60	0.14-0.24	0.0-2.9	.32	.32			
3072A:											
Sharon----------	0-25	10-18	1.30-1.50	0.60-2.00	0.22-0.24	0.0-2.9	.43	.43	5	5	56
	25-80	5-18	1.35-1.65	0.60-2.00	0.11-0.22	0.0-2.9	.49	.49			

Table 19.--Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Erosion factors K	Erosion factors Kf	Erosion factors T	Wind erodi- bility group	Wind erodi- bility index
	In	Pct	g/cc	in/hr	In/in	Pct					
3085A:											
Jacob-----------	0-9	40-70	1.30-1.50	0.06-0.20	0.11-0.13	9.0-25.0	.24	.24	5	4	86
	9-60	60-75	1.35-1.45	0.01-0.06	0.10-0.13	9.0-25.0	.28	.28			
	60-80	60-75	1.35-1.45	0.01-0.06	0.10-0.13	9.0-25.0	.28	.28			
3108A:											
Bonnie----------	0-8	18-27	1.30-1.50	0.60-2.00	0.22-0.25	0.0-2.9	.37	.37	5	6	48
	8-37	18-27	1.40-1.60	0.20-0.60	0.21-0.24	0.0-2.9	.49	.49			
	37-70	18-30	1.40-1.60	0.20-0.60	0.14-0.24	0.0-2.9	.32	.32			
3382A:											
Belknap---------	0-7	8-18	1.30-1.55	0.20-2.00	0.21-0.25	0.0-2.9	.43	.43	5	5	56
	7-26	8-25	1.40-1.60	0.20-2.00	0.21-0.24	0.0-2.9	.49	.49			
	26-65	8-30	1.35-1.65	0.20-2.00	0.14-0.24	0.0-2.9	.49	.49			
3422A:											
Cape------------	0-10	30-40	1.30-1.60	0.06-0.20	0.15-0.19	3.0-5.9	.32	.32	5	7	38
	10-22	35-50	1.30-1.60	0.06-0.20	0.15-0.19	3.0-5.9	.32	.32			
	22-80	35-65	1.30-1.60	0.01-0.06	0.10-0.13	6.0-8.9	.28	.28			
W.											
Water											

Table 20.--Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Effective cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
2A:						
Cisne-----------	0-8	5.1-7.3	1.0-3.0	8.0-21	---	0
	8-17	4.5-6.5	0.2-1.5	6.0-19	4.5-14	0
	17-37	4.5-6.0	0.2-0.5	18-30	14-28	0
	37-60	5.1-6.5	0.0-0.5	12-29	9-22	0
	60-80	5.6-7.3	0.0-0.3	13-28	---	0
3A:						
Hoyleton--------	0-8	4.5-7.3	1.5-3.5	11-26	---	0
	8-11	4.5-7.3	0.3-1.5	7.0-24	5.3-18	0
	11-39	4.5-6.5	0.2-0.5	20-37	15-28	0
	39-80	5.1-7.3	0.0-0.3	15-26	11-20	0
3B2:						
Hoyleton--------	0-7	4.5-7.3	1.5-3.0	11-26	---	0
	7-39	4.5-6.5	0.2-0.5	20-37	18-27	0
	39-80	5.1-7.3	0.0-0.3	10-21	---	0
4B2:						
Richview--------	0-9	5.1-7.3	1.5-3.0	12-17	---	0
	9-37	4.5-6.0	0.5-1.5	15-25	11-19	0
	37-73	5.1-7.3	0.0-0.2	10-20	7.5-15	0
4C2:						
Richview--------	0-9	5.1-7.3	1.5-3.0	12-17	---	0
	9-36	4.5-6.0	0.5-1.5	15-25	11-19	0
	36-78	5.1-7.3	0.0-0.2	10-20	7.5-15	0
5C3:						
Blair-----------	0-5	5.1-7.3	0.5-1.0	14-22	---	0
	5-12	4.5-6.0	0.2-0.8	15-23	11-17	0
	12-71	5.1-7.8	0.1-0.5	11-22	---	0-5
	71-80	5.6-7.8	0.1-0.3	12-17	---	0-20
8D3:						
Hickory---------	0-8	4.5-7.3	0.5-1.0	17-23	---	0
	8-46	4.5-6.0	0.1-0.5	16-22	12-16	0
	46-58	4.5-6.5	0.0-0.2	9.0-19	---	0
	58-80	5.6-8.4	0.0-0.2	5.0-15	---	0-25
10C:						
Plumfield-------	0-5	4.5-7.3	0.0-1.0	17-23	---	0
	5-12	4.5-6.5	0.0-0.5	12-19	---	0
	12-36	4.5-5.5	0.0-0.2	---	12-18	0
	36-60	4.5-5.5	0.0-0.2	---	12-18	0
10D:						
Plumfield-------	0-6	4.5-7.3	0.0-1.0	17-23	---	0
	6-21	4.5-6.5	0.0-0.5	12-19	---	0
	21-44	4.5-5.5	0.0-0.2	---	12-18	0
	44-60	4.5-5.5	0.0-0.2	---	12-18	0
12A:						
Wynoose---------	0-7	5.1-7.3	1.0-2.0	8.0-21	---	0
	7-20	3.6-6.0	0.2-1.5	8.0-19	5.0-16	0
	20-36	3.6-6.0	0.2-0.5	21-35	18-32	0
	36-66	3.6-6.0	0.0-0.3	15-29	12-26	0
	66-80	5.6-7.8	0.0-0.3	15-29	---	0

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Effective cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
13A:						
Bluford---------	0-7	5.6-7.3	1.0-2.0	7.0-19	---	0
	7-20	3.6-6.0	0.2-1.5	8.0-21	5.0-18	0
	20-35	3.6-6.0	0.2-0.5	21-38	18-35	0
	35-60	3.6-6.0	0.0-0.3	12-29	9.0-26	0
13B2:						
Bluford---------	0-7	5.6-7.3	1.0-2.0	7.0-19	---	0
	7-27	3.6-6.0	0.2-0.5	21-38	18-35	0
	27-80	3.6-6.0	0.0-0.3	12-29	9.0-26	0
14B:						
Ava-------------	0-8	6.1-7.3	1.0-2.0	8.0-20	---	0
	8-18	5.1-6.5	0.2-1.5	8.0-18	5.0-15	0
	18-36	4.5-5.5	0.2-0.5	10-23	7.0-20	0
	36-53	4.5-5.5	0.0-0.3	6.0-19	3.0-16	0
	53-80	4.5-6.0	0.0-0.3	6.0-19	3.0-16	0
14B2:						
Ava-------------	0-9	4.5-7.3	0.5-2.0	10-18	---	0
	9-28	4.0-5.5	0.2-0.8	16-25	12-19	0
	28-64	4.5-5.5	0.0-0.5	8.0-16	6.0-12	0
	64-78	4.5-6.0	0.0-0.2	9.3-19	7.0-14	0
14C2:						
Ava-------------	0-9	4.5-7.3	0.5-2.0	10-18	---	0
	9-28	4.0-5.5	0.2-0.8	16-25	12-19	0
	28-64	4.5-5.5	0.0-0.5	8.0-16	6.0-12	0
	64-78	4.5-6.0	0.0-0.2	9.3-19	7.0-14	0
15D3:						
Parke-----------	0-9	5.1-7.0	0.5-2.0	11-25	---	0
	9-30	4.5-6.0	0.0-0.5	11-29	8.0-22	0
	30-78	4.5-6.5	0.0-0.2	9.0-25	7.0-19	0
84A:						
Okaw------------	0-7	4.5-7.3	1.0-2.0	10-20	---	0
	7-15	4.5-6.5	0.1-0.5	10-15	---	0
	15-54	3.6-7.3	0.1-0.5	24-36	---	0
	54-80	4.5-8.4	0.1-0.5	21-35	---	0-10
109A:						
Racoon----------	0-7	4.5-7.3	1.0-2.5	13-20	---	0
	7-29	4.5-7.3	0.2-0.8	11-17	---	0
	29-41	4.5-5.5	0.1-0.5	23-33	17-25	0
	41-51	4.5-6.0	0.0-0.2	23-31	17-23	0
	51-80	4.5-6.5	0.0-0.2	16-31	12-23	0
122B:						
Colp------------	0-7	5.1-7.8	1.0-2.0	14-20	---	0
	7-13	5.1-7.8	0.0-1.0	17-23	---	0
	13-45	4.5-5.0	0.0-0.5	28-41	21-31	0
	45-60	4.5-8.4	0.0-0.5	18-28	14-21	0-15
122B2:						
Colp------------	0-7	5.1-7.8	1.0-2.0	14-20	---	0
	7-35	4.5-5.0	0.0-0.5	28-41	21-31	0
	35-60	4.5-8.4	0.0-0.5	18-28	14-21	0-15

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Effective cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
122C3:						
Colp------------	0-7	5.1-7.8	0.5-1.0	17-23	---	0
	7-48	4.5-5.0	0.0-0.5	28-41	21-31	0
	48-60	4.5-8.4	0.0-0.5	18-28	14-21	0-15
122D3:						
Colp------------	0-5	5.1-7.3	0.5-1.0	17-23	---	0
	5-30	4.5-5.0	0.0-0.5	28-41	21-31	0
	30-60	4.5-8.4	0.0-0.5	18-28	14-21	0-15
287A:						
Chauncey--------	0-12	4.5-6.5	2.0-4.0	13-21	---	0
	12-26	4.5-6.0	0.0-1.0	---	9.0-14	0
	26-46	4.5-6.0	0.0-0.5	---	21-27	0
	46-60	5.6-7.3	0.0-0.5	13-22	---	0
301B:						
Grantsburg------	0-9	4.5-6.5	1.0-2.0	12-27	9.0-20	0
	9-37	3.6-5.5	0.0-0.8	---	15-21	0
	37-61	3.6-5.5	0.0-0.2	---	12-19	0
	61-80	3.6-6.5	0.0-0.2	---	12-16	0
301C3:						
Grantsburg------	0-5	4.5-6.5	0.2-1.0	12-27	9.0-20	0
	5-17	3.6-5.5	0.0-0.2	---	15-21	0
	17-47	3.6-5.5	0.0-0.2	---	12-19	0
	47-91	4.5-6.5	0.0-0.2	---	12-16	0
337A:						
Creal-----------	0-6	5.1-7.3	1.0-3.0	14-22	---	0
	6-25	3.6-6.5	0.0-0.5	11-16	8.3-12	0
	25-37	4.5-6.5	0.0-0.2	15-22	11-16	0
	37-80	4.5-7.3	0.0-0.2	12-17	9.0-13	0
338A:						
Hurst-----------	0-7	5.1-7.3	1.0-3.0	14-20	---	0
	7-12	3.6-6.0	0.1-0.5	11-19	8.3-14	0
	12-53	3.6-7.8	0.1-0.5	21-29	16-22	0
	53-80	4.5-8.4	0.1-0.5	12-27	9.0-20	0-5
340D3:						
Zanesville------	0-2	4.5-6.0	0.2-1.0	11-20	8.0-15	0
	2-19	4.5-6.0	0.0-0.5	---	8.0-15	0
	19-39	4.5-6.0	0.0-0.2	---	8.0-15	0
	39-49	4.5-6.0	0.0-0.2	---	5.0-20	0
	49-60	---	---	---	---	---
376A:						
Cisne, bench----	0-8	5.1-7.3	1.0-3.0	8.0-21	---	0
	8-17	4.5-6.5	0.2-1.5	6.0-19	4.5-14	0
	17-37	4.5-6.0	0.2-0.5	18-30	14-28	0
	37-60	5.1-6.5	0.0-0.5	12-29	---	0
	60-80	5.6-7.3	0.0-0.3	13-28	---	0
377A:						
Hoyleton, bench	0-8	4.5-7.3	1.5-3.5	11-26	---	0
	8-11	4.5-7.3	0.3-1.5	7.0-24	5.3-18	0
	11-39	4.5-6.5	0.2-0.5	20-37	15-28	0
	39-80	5.1-7.3	0.0-0.3	15-26	11-20	0

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Effective cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
377B2:						
Hoyleton, bench	0-7	4.5-7.3	1.5-3.0	11-26	---	0
	7-39	4.5-6.5	0.2-0.5	20-37	18-27	0
	39-80	5.1-7.3	0.0-0.3	10-21	---	0
421G:						
Kell------------	0-3	4.5-6.0	1.0-5.0	10-23	7.5-17	0
	3-7	4.5-6.0	0.2-1.0	7.0-14	5.0-10	0
	7-13	4.5-6.0	0.2-0.5	14-25	11-19	0
	13-35	4.0-6.0	0.2-0.5	6.5-18	5.0-21	0
	35-60	---	---	---	---	---
518B:						
Rend------------	0-8	4.5-7.3	0.5-2.0	13-20	---	0
	8-11	4.5-5.5	0.2-1.0	13-20	10-15	0
	11-23	4.5-5.5	0.0-0.5	---	13-21	0
	23-77	4.5-6.5	0.0-0.5	---	14-22	0
	77-80	4.5-6.5	0.0-0.5	---	12-19	0
518B2:						
Rend------------	0-8	4.5-7.3	0.5-2.0	13-20	---	0
	8-23	4.5-5.5	0.0-0.5	---	13-21	0
	23-77	4.5-6.5	0.0-0.5	---	14-22	0
	77-80	4.5-6.5	0.0-0.5	---	12-19	0
518C2:						
Rend------------	0-8	4.5-7.3	0.5-2.0	13-20	---	0
	8-23	4.5-5.5	0.0-0.5	---	13-21	0
	23-77	4.5-6.5	0.0-0.5	---	14-22	0
	77-80	4.5-6.5	0.0-0.5	---	12-19	0
533.						
Urban land						
536.						
Dumps, mine						
583B:						
Pike------------	0-8	4.5-7.3	1.0-2.0	8.0-21	---	0
	8-38	4.5-6.0	0.0-0.5	15-25	11-19	0
	38-57	4.5-6.0	0.0-0.2	8.0-17	6.0-13	0
	57-99	4.5-6.0	0.0-0.2	8.0-17	6.0-13	0
583C2:						
Pike------------	0-6	5.1-7.3	1.0-2.0	8.0-21	---	0
	6-38	4.5-6.0	0.0-0.5	15-25	11-19	0
	38-57	4.5-6.0	0.0-0.2	8.0-17	6.0-13	0
	57-99	4.5-6.0	0.0-0.2	8.0-17	6.0-13	0
639A:						
Wynoose, bench--	0-7	5.1-7.3	1.0-2.5	8.0-21	---	0
	7-20	3.6-6.0	0.2-1.5	8.0-19	5.0-16	0
	20-36	3.6-6.0	0.2-0.5	21-35	18-32	0
	36-66	3.6-6.0	0.0-0.3	15-29	12-26	0
	66-80	5.6-7.8	0.0-0.3	15-29	---	0
640A:						
Bluford, bench--	0-7	5.6-7.3	1.0-2.5	7.0-19	---	0
	7-20	3.6-6.0	0.2-1.5	8.0-21	5.0-18	0
	20-35	3.6-6.0	0.2-0.5	21-38	18-35	0
	35-60	3.6-6.0	0.0-0.3	12-29	9.0-26	0

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Effective cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
802B:						
Orthents, loamy	0-6	5.6-7.3	0.5-1.0	9.0-12	---	0
	6-60	5.6-7.3	0.1-0.5	9.0-20	---	0
802F:						
Orthents, loamy	0-6	5.6-7.3	0.1-1.0	7.0-18	---	0-10
	6-60	5.6-7.3	0.0-0.5	7.0-20	---	0-20
823B:						
Schuline--------	0-10	5.6-8.4	0.5-2.0	10-20	---	0-20
	10-60	7.4-8.4	0.1-0.5	11-22	---	5-35
866.						
Dumps, slurry						
871D:						
Lenzburg--------	0-3	6.6-8.4	0.5-2.0	17-29	---	0-20
	3-26	6.6-8.4	0.2-1.0	11-23	---	0-25
	26-60	6.6-8.4	0.2-1.0	11-23	---	0-25
908F:						
Hickory---------	0-3	4.5-6.0	1.0-3.0	14-19	10-14	0
	3-16	4.5-6.0	0.2-1.0	14-19	10-14	0
	16-43	4.5-6.0	0.1-0.5	9.0-19	7.0-14	0
	43-60	4.5-6.0	0.1-0.3	9.0-19	7.0-14	0
Kell------------	0-3	4.5-6.0	1.0-5.0	10-23	7.5-17	0
	3-7	4.5-6.0	0.2-1.0	7.0-14	5.0-10	0
	7-13	4.5-6.0	0.2-0.5	14-25	11-19	0
	13-35	4.0-6.0	0.2-0.5	6.5-18	5.0-21	0
	35-60	---	---	---	---	---
927D3:						
Blair-----------	0-5	5.1-7.3	0.5-1.0	14-22	---	0
	5-12	4.5-6.0	0.2-0.8	15-23	11-17	0
	12-71	5.1-7.8	0.1-0.5	11-22	---	0-5
	71-80	5.6-7.8	0.1-0.3	12-17	---	0-20
Atlas-----------	0-8	4.5-7.3	0.5-1.8	20-27	15-20	0
	8-43	4.5-7.8	0.1-0.5	18-29	14-22	0
	43-60	6.1-7.8	0.1-0.5	12-20	---	0-5
1085A:						
Jacob-----------	0-9	5.1-6.5	1.0-3.0	35-45	---	0
	9-60	3.6-5.5	0.0-1.0	---	35-45	0
	60-80	3.6-7.8	0.0-0.5	35-45	35-45	0
1108A:						
Bonnie----------	0-8	4.5-7.3	1.0-3.0	13-22	---	0
	8-37	4.5-5.5	0.0-1.0	---	8.3-15	0
	37-70	4.5-7.8	0.0-1.0	11-20	---	0
3072A:						
Sharon----------	0-25	4.5-5.5	0.5-2.0	---	7.0-20	0
	25-80	4.5-7.3	0.2-0.5	4.0-13	3.0-10	0
3085A:						
Jacob-----------	0-9	5.1-6.5	1.0-3.0	35-45	---	0
	9-60	3.6-5.5	0.0-1.0	---	35-45	0
	60-80	3.6-7.8	0.0-0.5	35-45	35-45	0

Table 20.--Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Soil reaction	Organic matter	Cation-exchange capacity	Effective cation-exchange capacity	Calcium carbonate
	In	pH	Pct	meq/100 g	meq/100 g	Pct
3108A:						
Bonnie----------	0-8	4.5-7.3	1.0-3.0	13-22	---	0
	8-37	4.5-5.5	0.0-1.0	---	8.3-15	0
	37-70	4.5-7.8	0.0-1.0	11-20	---	0
3382A:						
Belknap---------	0-7	4.5-7.3	1.0-3.0	7.0-17	---	0
	7-26	4.5-5.5	0.0-2.0	5.0-19	3.8-14	0
	26-65	4.5-7.3	0.0-1.0	5.0-22	---	0
3422A:						
Cape------------	0-10	4.5-7.3	1.0-3.0	20-30	15-22	0
	10-22	3.6-5.5	0.5-2.0	---	15-22	0
	22-80	3.6-5.5	0.1-1.0	---	8.0-26	0
W.						
Water						

Table 21.--Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydro-logic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
2A:										
Cisne	D	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Jun	0.0-2.0	2.0-6.0	Perched	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
3A:										
Hoyleton	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	1.0-3.0	>6.0	Apparent	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
3B2:										
Hoyleton	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	1.0-3.0	>6.0	Apparent	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
4B2:										
Richview	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	4.0-6.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
4C2:										
Richview	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	4.0-6.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
5C3:										
Blair	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	1.5-3.5	>6.0	Apparent	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
8D3:										
Hickory	C	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
10C:										
Plumfield	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	1.5-3.5	3.5-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
10D:										
Plumfield	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	1.5-3.5	3.5-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
12A:										
Wynoose	D	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	0.0-2.0	2.0-6.0	Perched	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
13A:										
Bluford	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	1.0-3.0	3.0-6.0	Perched	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
13B2:										
Bluford	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	1.0-3.0	3.0-6.0	Perched	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
14B:										
Ava	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	1.5-3.5	3.5-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
14B2:										
Ava	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	1.5-3.5	3.5-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
14C2:										
Ava	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	1.5-3.5	3.5-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
15D3:										
Parke	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
84A:										
Okaw	D	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb	0.0-1.0	>6.0	Apparent	---	---	None	---	None
		Mar-Jun	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Frequent	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
109A:										
Racoon	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb	0.0-1.0	>6.0	Apparent	---	---	None	---	None
		Mar-Jun	0.0-1.0	>6.0	Apparent	0.0-0.5	Brief	Occasional	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
122B:										
Colp	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	2.0-4.0	>6.0	Apparent	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
122B2:										
Colp	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	2.0-4.0	>6.0	Apparent	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
122C3:										
Colp	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	2.0-4.0	>6.0	Apparent	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
122D3:										
Colp	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	2.0-4.0	>6.0	Apparent	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
287A:										
Chauncey	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Jun	0.0-2.0	2.0-6.0	Perched	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
301B:										
Grantsburg	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	1.5-3.5	3.5-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
301C3:										
Grantsburg	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	1.5-3.5	3.5-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
337A:										
Creal	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	1.0-3.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
338A:										
Hurst	D	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	1.0-3.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
340D3:										
Zanesville	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Apr	2.0-3.0	3.0-6.0	Perched	---	---	None	---	None
		May-Dec	>6.0	>6.0	---	---	---	None	---	None
376A:										
Cisne, bench	D	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-Jun	0.0-2.0	2.0-6.0	Perched	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
377A:										
Hoyleton, bench	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	1.0-3.0	>6.0	Apparent	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
377B2:										
Hoyleton, bench	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	1.0-3.0	>6.0	Apparent	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
421G:										
Kell	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
518B:										
Rend	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	2.0-3.5	3.5-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
518B2:										
Rend	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	2.0-3.5	3.5-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
518C2:										
Rend	C	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	2.0-3.5	3.5-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
533.										
Urban land										

Table 21.--Water Features--Continued

Map symbol and soil name	Hydrologic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
536. Dumps, mine										
583B:										
Pike	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
583C2:										
Pike	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
639A:										
Wynoose, bench	D	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	0.0-2.0	2.0-6.0	Perched	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
640A:										
Bluford, bench	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	1.0-3.0	3.0-6.0	Perched	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
802B:										
Orthents, loamy	B	Jan	>6.0	>6.0	---	---	---	None		
		Feb-May	3.5-6.0	>6.0	Apparent	---	---	None		
		Jun	>6.0	>6.0	---	---	---	None		
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
802F:										
Orthents, loamy	B	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	3.5-6.0	>6.0	Apparent	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
823B:										
Schuline	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
866. Dumps, slurry										
871D:										
Lenzburg	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
908F:										
Hickory	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
Kell	B	Jan-Dec	>6.0	>6.0	---	---	---	None	---	None
927D3:										
Blair	C	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	1.5-3.5	>6.0	Apparent	---	---	None	---	None
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
Atlas	D	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	1.0-2.0	2.0-6.0	Perched	---	---	None	---	None
		Jun-Dec	>6.0	>6.0	---	---	---	None	---	None
1085A:										
Jacob	D	Jan-Jun	0.0-0.5	>6.0	Apparent	0.0-2.0	Long	Frequent	Long	Frequent
		Jul-Oct	>6.0	>6.0	---	---	---	---	---	None
		Nov-Dec	0.0-0.5	>6.0	Apparent	0.0-2.0	Long	Frequent	Long	Frequent

Table 21.--Water Features--Continued

Map symbol and soil name	Hydro-logic group	Months	Water table depth: Upper limit	Water table depth: Lower limit	Kind of water table	Ponding: Surface water depth	Ponding: Duration	Ponding: Frequency	Flooding: Duration	Flooding: Frequency
			Ft	Ft		Ft				
1108A:										
Bonnie----------------	D	Jan-Jun	0.0-0.5	>6.0	Apparent	0.0-2.0	Long	Frequent	Long	Frequent
		Jul-Oct	>6.0	>6.0	---	---	---	---	---	None
		Nov-Dec	0.0-0.5	>6.0	Apparent	0.0-2.0	Long	Frequent	Long	Frequent
3072A:										
Sharon----------------	B	Jan-Feb	>6.0	>6.0	---	---	---	None	---	None
		Mar-Jun	3.0-6.0	>6.0	Apparent	---	---	None	Brief	Frequent
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
3085A:										
Jacob-----------------	D	Jan	>6.0	>6.0	---	---	---	None	---	None
		Feb-May	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	Brief	Frequent
		Jun-Jul	>6.0	>6.0	---	---	---	None	Brief	Frequent
		Aug-Dec	>6.0	>6.0	---	---	---	None	---	None
3108A:										
Bonnie----------------	C/D	Jan-Jun	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	Brief	Frequent
		Jul-Dec	>6.0	>6.0	---	---	---	---	---	None
3382A:										
Belknap---------------	C	Jan-Jun	1.0-3.0	>6.0	Apparent	---	---	None	Brief	Frequent
		Jul-Dec	>6.0	>6.0	---	---	---	None	---	None
3422A:										
Cape------------------	D	Jan	>6.0	>6.0	---	---	---	---	---	None
		Feb-Jun	0.0-1.0	>6.0	Apparent	0.0-1.0	Brief	Occasional	Brief	Frequent
		Jul	0.0-1.0	>6.0	Apparent	---	---	---	---	None
		Aug-Dec	>6.0	>6.0	---	---	---	---	---	None
W.										
Water										

Table 22.--Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

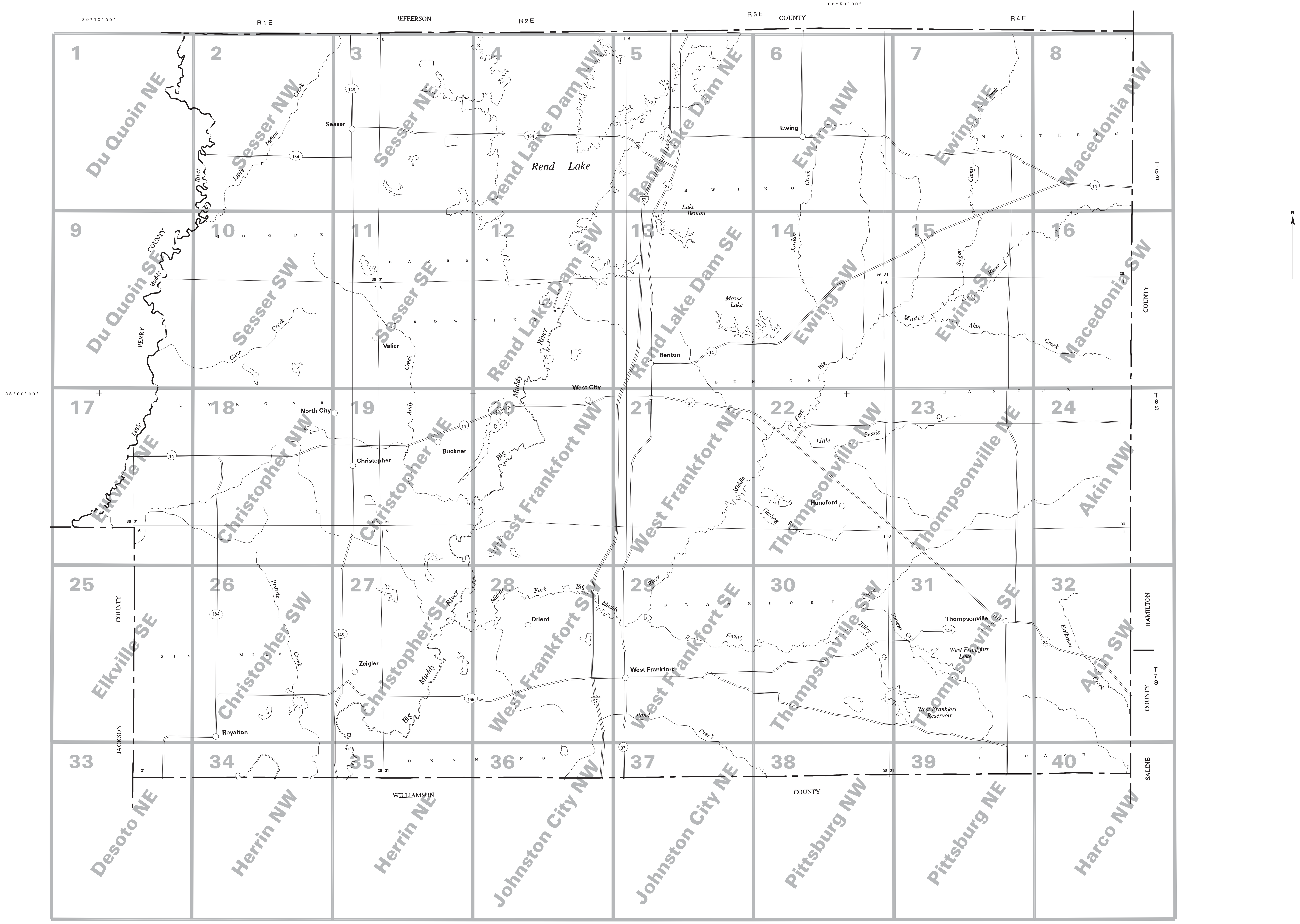
Map symbol and soil name	Restrictive layer		Potential for frost action	Risk of corrosion	
	Kind	Depth to top		Uncoated steel	Concrete
		In			
2A:					
Cisne	---	---	High	High	Moderate
3A:					
Hoyleton	---	---	High	High	High
3B2:					
Hoyleton	---	---	High	High	High
4B2:					
Richview	---	---	High	Moderate	High
4C2:					
Richview	---	---	High	Moderate	High
5C3:					
Blair	---	---	High	High	High
8D3:					
Hickory	---	---	Moderate	Moderate	Moderate
10C:					
Plumfield	Fragipan	5-20	High	High	High
10D:					
Plumfield	Fragipan	5-20	High	High	High
12A:					
Wynoose	---	---	High	High	High
13A:					
Bluford	---	---	High	High	High
13B2:					
Bluford	---	---	High	High	High
14B:					
Ava	Fragipan	25-40	High	Moderate	High
14B2:					
Ava	Fragipan	25-40	High	Moderate	High
14C2:					
Ava	Fragipan	25-40	High	Moderate	High
15D3:					
Parke	---	---	High	Moderate	High
84A:					
Okaw	---	---	High	High	High
109A:					
Racoon	---	---	High	High	High
122B:					
Colp	---	---	High	High	High

Table 22.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In			
122B2:					
Colp	---	---	High	High	High
122C3:					
Colp	---	---	High	High	High
122D3:					
Colp	---	---	High	High	High
287A:					
Chauncey	---	---	High	High	High
301B:					
Grantsburg	Fragipan	24-40	High	High	High
301C3:					
Grantsburg	Fragipan	24-40	High	High	High
337A:					
Creal	---	---	High	High	High
338A:					
Hurst	---	---	Moderate	High	High
340D3:					
Zanesville	Fragipan	20-32	Moderate	Moderate	High
	Bedrock (lithic)	40-80			
376A:					
Cisne, bench	---	---	High	High	Moderate
377A:					
Hoyleton, bench	---	---	High	High	High
377B2:					
Hoyleton, bench	---	---	High	High	High
421G:					
Kell	Bedrock (paralithic)	20-40	Moderate	Moderate	High
518B:					
Rend	---	---	High	Moderate	High
518B2:					
Rend	---	---	High	Moderate	High
518C2:					
Rend	---	---	High	Moderate	High
533.					
Urban land					
536.					
Dumps, mine					
583B:					
Pike	---	---	High	Low	High
583C2:					
Pike	---	---	High	Low	High

Table 22.--Soil Features--Continued

Map symbol and soil name	Restrictive layer: Kind	Restrictive layer: Depth to top	Potential for frost action	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
		In			
639A:					
Wynoose, bench	---	---	High	High	High
640A:					
Bluford, bench	---	---	High	High	High
802B, 802F:					
Orthents, loamy	---	---	Moderate	Moderate	Moderate
823B:					
Schuline	---	---	Moderate	Moderate	Low
866.					
Dumps, slurry					
871D:					
Lenzburg	---	---	Moderate	Moderate	Low
908F:					
Hickory	---	---	Moderate	Moderate	Moderate
Kell	Bedrock (paralithic)	20-40	Moderate	Moderate	High
927D3:					
Blair	---	---	High	High	High
Atlas	---	---	High	High	Moderate
1085A:					
Jacob	---	---	Moderate	High	High
1108A:					
Bonnie	---	---	High	High	High
3072A:					
Sharon	---	---	High	Low	High
3085A:					
Jacob	---	---	Moderate	High	High
3108A:					
Bonnie	---	---	High	High	High
3382A:					
Belknap	---	---	High	High	High
3422A:					
Cape	---	---	High	High	High
W.					
Water					



SECTIONALIZED TOWNSHIP					
6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS
FRANKLIN COUNTY, ILLINOIS

MILES

KILOMETERS

SCALE = 1:90000

SOIL LEGEND

Most map symbols consist of a combination of numbers and letters. The initial numbers represent the kind of soil. An uppercase letter following the initial numbers represents the class of slope. A final number of 2 following the slope class letter indicates that the soil is moderately eroded, and a final number of 3 indicates that it is severely eroded. Map symbols that do not have a slope class letter are for miscellaneous areas.

SYMBOL	NAME
2A	Cisne silt loam, 0 to 2 percent slopes
3A	Hoyleton silt loam, 0 to 2 percent slopes
3B2	Hoyleton silt loam, 2 to 5 percent slopes, eroded
4B2	Richview silt loam, 2 to 5 percent slopes, eroded
4C2	Richview silt loam, 5 to 10 percent slopes, eroded
5C3	Blair silty clay loam, 5 to 10 percent slopes, severely eroded
8D3	Hickory clay loam, 10 to 18 percent slopes, severely eroded
10C	Plumfield silty clay loam, 5 to 10 percent slopes
10D	Plumfield silty clay loam, 10 to 18 percent slopes
12A	Wynoose silt loam, 0 to 2 percent slopes
13A	Bluford silt loam, 0 to 2 percent slopes
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded
14B	Ava silt loam, 2 to 5 percent slopes
14B2	Ava silt loam, 2 to 5 percent slopes, eroded
14C2	Ava silt loam, 5 to 10 percent slopes, eroded
15D3	Parke silty clay loam, 10 to 18 percent slopes, severely eroded
84A	Okaw silt loam, 0 to 2 percent slopes
109A	Racoon silt loam, 0 to 2 percent slopes
122B	Colp silt loam, 2 to 5 percent slopes
122B2	Colp silt loam, 2 to 5 percent slopes, eroded
122C3	Colp silty clay loam, 5 to 10 percent slopes, severely eroded
122D3	Colp silty clay loam, 10 to 18 percent slopes, severely eroded
287A	Chauncey silt loam, 0 to 2 percent slopes
301B	Grantsburg silt loam, 2 to 5 percent slopes
301C3	Grantsburg silty clay loam, 5 to 10 percent slopes, severely eroded
337A	Creal silt loam, 0 to 2 percent slopes
338A	Hurst silt loam, 0 to 2 percent slopes
340D3	Zanesville silty clay loam, 10 to 18 percent slopes, severely eroded
376A	Cisne silt loam, bench, 0 to 2 percent slopes
377A	Hoyleton silt loam, bench, 0 to 2 percent slopes
377B2	Hoyleton silt loam, bench, 2 to 5 percent slopes, eroded
421G	Kell silt loam, 35 to 60 percent slopes
518B	Rend silt loam, 2 to 5 percent slopes
518B2	Rend silt loam, 2 to 5 percent slopes, eroded
518C2	Rend silt loam, 5 to 10 percent slopes, eroded
533	Urban land
536	Dumps, mine
583B	Pike silt loam, 2 to 5 percent slopes
583C2	Pike silt loam, 5 to 10 percent slopes, eroded
639A	Wynoose silt loam, bench, 0 to 2 percent slopes
640A	Bluford silt loam, bench, 0 to 2 percent slopes
802B	Orthents, loamy, undulating
802F	Orthents, loamy, hilly and very hilly
823B	Schuline silt loam, 1 to 5 percent slopes
866	Dumps, slurry
871D	Lenzburg gravelly silty clay loam, 7 to 20 percent slopes
908F	Hickory-Kell silt loams, 18 to 35 percent slopes
927D3	Blair-Atlas silty clay loams, 10 to 18 percent slopes, severely eroded
1085A	Jacob silty clay, undrained, 0 to 2 percent slopes, frequently flooded
1108A	Bonnie silt loam, undrained, 0 to 2 percent slopes, frequently flooded
3072A	Sharon silt loam, 0 to 2 percent slopes, frequently flooded
3085A	Jacob silty clay, 0 to 2 percent slopes, frequently flooded
3108A	Bonnie silt loam, 0 to 2 percent slopes, frequently flooded
3382A	Belknap silt loam, 0 to 2 percent slopes, frequently flooded
3422A	Cape silty clay loam, 0 to 2 percent slopes, frequently flooded
W	Water

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state, or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park)
- Land grant
- Limit of soil survey (label) and/or denied access area
- Field sheet matchline & neatline
- Previously Published Survey

OTHER BOUNDARY (label)

- Airport, airfield
- Cemetery
- City/county park

STATE COORDINATE TICK 1 890 000 FEET

LAND DIVISION CORNER (section and land grants)

GEOGRAPHIC COORDINATE TICK

TRANSPORTATION

- Divided roads
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate — 173, 79 345
- Federal — 287, 410 224
- State — 52, 52 347
- County, farm or ranch — 1283

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad
- Single side slope (showing actual feature location)

DAMS

- Medium or Small

LANDFORM FEATURES

- Prominent hill or peak
- Soil Sample Site

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Other Religion (label) — Mt Carmel
- Located object (label) — Ranger Station
- Tank (label) — Petroleum
- Lookout Tower
- Oil and/or Natural Gas Wells
- Windmill
- Lighthouse

HYDROGRAPHIC FEATURES

STREAMS

- Perennial, double line
- Perennial, single line — Label only
- Intermittent — Label only
- Drainage end — Label only

DRAINAGE AND IRRIGATION

- Double-line canal (label) — CANAL
- Perennial drainage and/or irrigation ditch — Label Only
- Intermittent drainage and/ or irrigation ditch — Label Only

SMALL LAKES, PONDS AND RESERVOIRS

- Perennial water
- Miscellaneous water
- Flood pool line — FLOOD POOL LINE

MISCELLANEOUS WATER FEATURES

- Spring
- Well, artesian
- Well, irrigation

SPECIAL SYMBOLS FOR SOIL SURVEY AND SSURGO

SOIL DELINEATIONS AND SYMBOLS — 4B2 14B2

LANDFORM FEATURES

ESCARPMENTS

- Bedrock
- Other than bedrock

SHORT STEEP SLOPE

GULLY

DEPRESSION, closed

SINKHOLE

EXCAVATIONS

PITS

- Borrow pits
- Gravel pit
- Mine or quarry

LANDFILL

MISCELLANEOUS SURFACE FEATURES

- Blowout
- Clay spot
- Gravelly spot
- Lava flow
- Marsh or swamp
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip
- Sodic spot
- Spoil area
- Stony spot
- Very stony spot
- Wet spot
- Subsided spot
- Oil brine spot

Definitions of Special Symbols

Name	Description	Label
Blowout	A small saucer-, cup-, or trough-shaped hollow or depression formed by wind erosion on a preexisting sand deposit. Typically 0.2 acre to 2.0 acres.	BLO
Borrow pit	An open excavation from which soil and underlying material have been removed, usually for construction purposes. Typically 0.2 acre to 2.0 acres.	BPI
Calcareous spot	An area in which the soil contains carbonates in the surface layer. The surface layer of the named soils in the surrounding map unit is noncalcareous. Typically 0.5 acre to 2.0 acres.	CSP
Clay spot	A spot where the surface layer is silty clay or clay in areas where the surface layer of the soils in the surrounding map unit is sandy loam, loam, silt loam, or coarser. Typically 0.2 acre to 2.0 acres.	CLA
Depression, closed	A shallow, saucer-shaped area that is slightly lower on the landscape than the surrounding area and that does not have a natural outlet for surface drainage. Typically 0.2 acre to 2.0 acres.	DEP
Disturbed soil spot	An area in which the soil has been removed and materials redeposited as a result of human activity. Typically 0.25 acre to 2.0 acres.	DSS
Dumps	Areas of nonsoil material that support little or no vegetation. Typically 0.5 acre to 2.0 acres.	DMP
Escarpment, bedrock	A relatively continuous and steep slope or cliff, produced by erosion or faulting, that breaks the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.	ESB
Escarpment, nonbedrock	A relatively continuous and steep slope or cliff, generally produced by erosion but in some places produced by faulting, that breaks the continuity of more gently sloping land surfaces. Exposed earthy material is nonsoil or very shallow soil.	ESO
Glacial till spot	An exposure of glacial till at the surface of the earth. Typically 0.25 acre to 2.0 acres.	GLA
Gravel pit	An open excavation from which soil and underlying material have been removed and used, without crushing, as a source of sand or gravel. Typically 0.2 acre to 2.0 acres.	GPI
Gravelly spot	A spot where the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter in an area that has less than 15 percent rock fragments. Typically 0.2 acre to 2.0 acres.	GRA

Name	Description	Label
Gray spot	A spot in which the surface layer is gray in areas where the subsurface layer of the named soils in the surrounding map unit are darker. Typically 0.25 acre to 2.0 acres.	GSP
Gully	A small channel with steep sides cut by running water through which water ordinarily runs only after a rain or after melting of snow or ice. It generally is an obstacle to wheeled vehicles and is too deep to be obliterated by ordinary tillage.	GUL
Iron bog	An accumulation of iron in the form of nodules, concretions, or soft masses on the surface or near the surface of soils. Typically 0.2 acre to 2.0 acres.	BFE
Landfill	An area of accumulated waste products of human habitation, either above or below natural ground level. Typically 0.2 acre to 2.0 acres.	LDF
Levee	An embankment that confines or controls water, especially one built along the banks of a river to prevent overflow onto lowlands.	LVS
Marsh or swamp	A water-saturated, very poorly drained area that is intermittently or permanently covered by water. Sedges, cattails, and rushes are the dominant vegetation in marshes, and trees or shrubs are the dominant vegetation in swamps. Typically 0.2 acre to 2.0 acres.	MAR
Mine or quarry	An open excavation from which soil and underlying material have been removed and in which bedrock is exposed. Also denotes surface openings to underground mines. Typically 0.2 acre to 2.0 acres.	MPI
Mine subsided area	An area that is lower than the soils in the surrounding map unit because of subsurface coal mining. Typically 0.25 acre to 3.0 acres.	MSA
Miscellaneous water	A small, constructed body of water that is used for industrial, sanitary, or mining applications and that contains water most of the year. Typically 0.2 acre to 2.0 acres.	MIS
Muck spot	An area that occurs within an area of poorly drained or very poorly drained soil and that has a histic epipedon or an organic surface layer. The symbol is used only in map units consisting of mineral soil. Typically 0.2 acre to 2.0 acres.	MUC
Oil brine spot	An area of soil that has been severely damaged by the accumulation of oil brine, with or without liquid oily wastes. The area is typically barren but may have a vegetative cover of salt-tolerant plants. Typically 0.2 acre to 2.0 acres.	OBS
Perennial water	A small, natural or constructed lake, pond, or pit that contains water most of the year. Typically 0.2 acre to 2.0 acres.	WAT

Name	Description	Label
Rock outcrop	An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock or where “Rock outcrop” is a named component of the map unit. Typically 0.2 acre to 2.0 acres.	ROC
Saline spot	An area where the surface layer has an electrical conductivity of 8 mmhos/cm-l more than the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has an electrical conductivity of 2 mmhos/cm-l or less. Typically 0.2 acre to 2.0 acres.	SAL
Sandy spot	A spot where the surface layer is loamy fine sand or coarser in areas where the surface layer of the named soils in the surrounding map unit is very fine sandy loam or finer. Typically 0.2 acre to 2.0 acres.	SAN
Severely eroded spot	An area where, on the average, 75 percent or more of the original surface layer has been lost because of accelerated erosion. Not used in map units in which “severely eroded,” “very severely eroded,” or “gullied” is part of the map unit name. Typically 0.2 acre to 2.0 acres.	ERO
Short steep slope	A narrow area of soil having slopes that are at least two slope classes steeper than the slope class of the surrounding map unit.	SLP
Sinkhole	A closed depression formed either by solution of the surficial rock or by collapse of underlying caves. Typically 0.2 acre to 2.0 acres.	SNK
Slide or slip	A prominent landform scar or ridge caused by fairly recent mass movement or descent of earthy material resulting from failure of earth or rock under shear stress along one or several surfaces. Typically 0.2 acre to 2.0 acres.	SLI
Sodic spot	An area where the surface layer has a sodium adsorption ratio that is at least 10 more than that of the surface layer of the named soils in the surrounding map unit. The surface layer of the surrounding soils has a sodium adsorption ratio of 5 or less. Typically 0.2 acre to 2.0 acres.	SOD
Spoil area	A pile of earthy materials, either smoothed or uneven, resulting from human activity. Typically 0.2 acre to 2.0 acres.	SPO
Stony spot	A spot where 0.01 to 0.1 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surrounding soil has no surface stones. Typically 0.2 acre to 2.0 acres.	STN
Unclassified water	A small, natural or manmade lake, pond, or pit that contains water, of an unspecified nature, most of the year. Typically 0.2 acre to 2.0 acres.	UWT

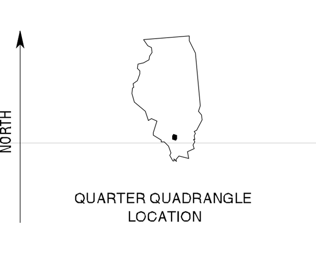
Name	Description	Label
Very stony spot	A spot where 0.1 to 3.0 percent of the surface cover is rock fragments that are more than 10 inches in diameter in areas where the surface cover of the surrounding soil is less than 0.01 percent stones. Typically 0.2 acre to 2.0 acres.	STV
Wet depression	A shallow, concave area within an area of poorly drained or very poorly drained soils in which water is ponded for intermittent periods. The concave area is saturated for appreciably longer periods of time than the surrounding soil. Typically 0.2 acre to 2.0 acres.	WDP
Wet spot	A somewhat poorly drained to very poorly drained area that is at least two drainage classes wetter than the named soils in the surrounding map unit. Typically 0.2 acres to 2.0 acres.	WET

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
DU QUOIN NE QUADRANGLE
SHEET NUMBER 1 OF 40

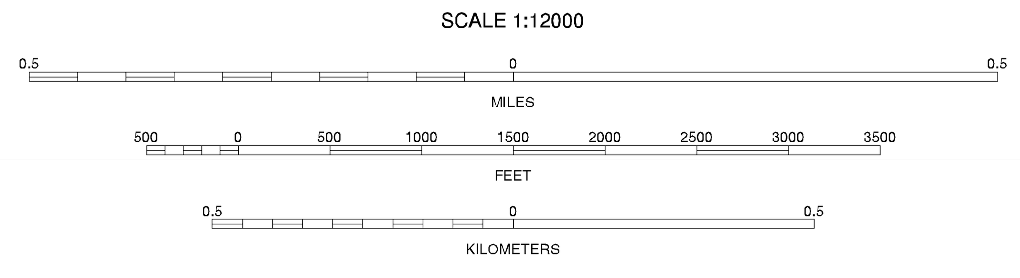
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

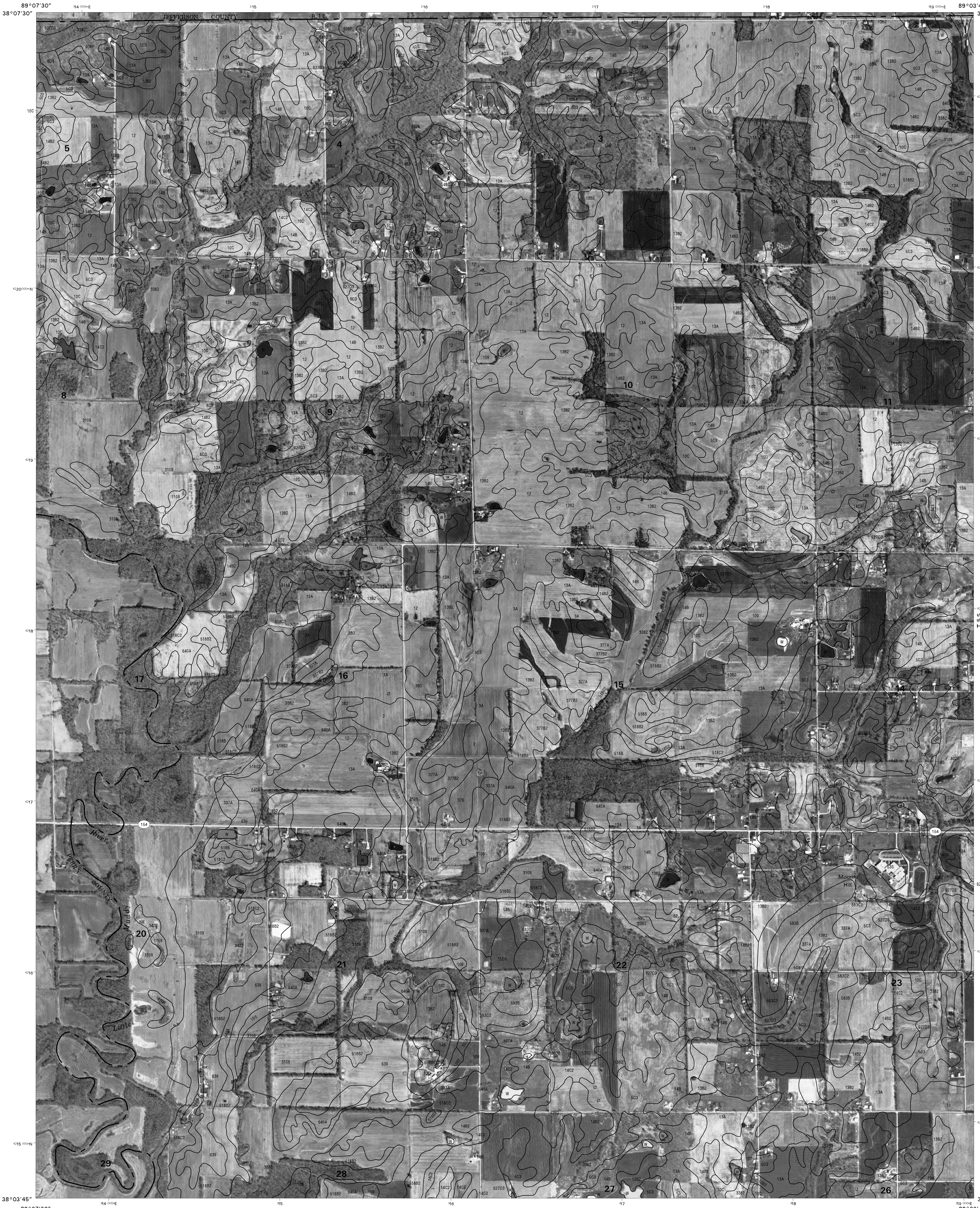
1 TAMAROA SW
2 TAMAROA SE
3 WALTONVILLE SW
4 DU QUOIN NW
5 SESSER NW (SHEET 2)
6 DU QUOIN SW
7 DU QUOIN SE (SHEET 9)
8 SESSER SW (SHEET 10)

INDEX TO ADJOINING 3.75 MAPS

DU QUOIN NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 1 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
SESSER NW QUADRANGLE
SHEET NUMBER 2 OF 40



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North American Datum of 1983 (NAD83). GRS-80 Spheroid
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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

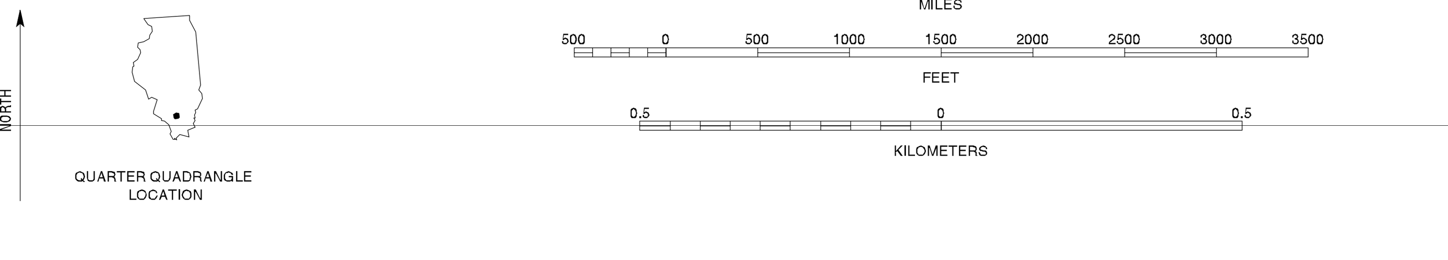
KILOMETERS

1	2	3
4		5
6	7	8

1 TAMAROA SE
2 WALTONVILLE SW
3 WALTONVILLE SE
4 DU QUOIN NE (SHEET 1)
5 SESSER NE (SHEET 3)
6 DU QUOIN SE (SHEET 9)
7 SESSER SW (SHEET 10)
8 SESSER SE (SHEET 11)

INDEX TO ADJOINING 3.75 MAPS

SESSER NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 2 OF 40



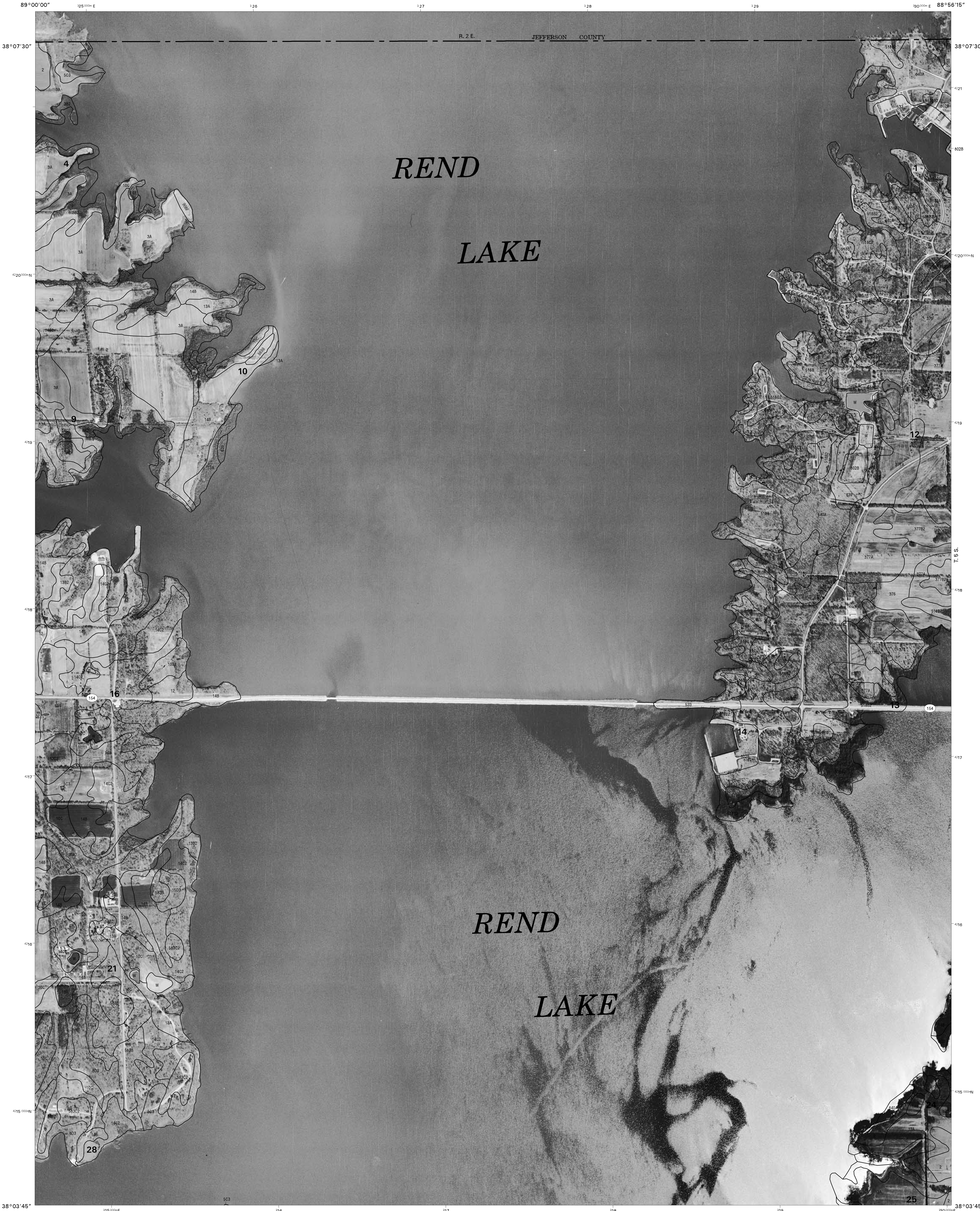
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

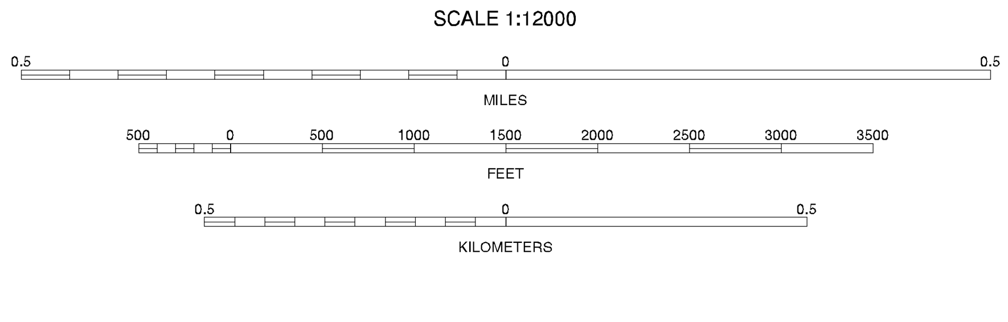
1 WALTONVILLE SW
2 WALTONVILLE SE
3 INA SW
4 SESSER NW (SHEET 2)
5 REND LAKE DAM NW (SHEET 4)
6 SESSER SW (SHEET 10)
7 SESSER SE (SHEET 11)
8 REND LAKE DAM SW (SHEET 12)

INDEX TO ADJOINING 3.75 MAPS

SESSER NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 3 OF 40



SCALE 1:12000



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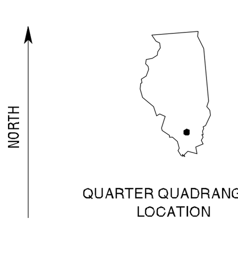
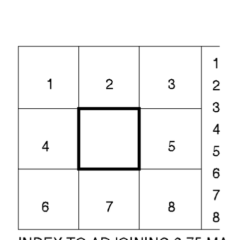
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION



1 WALTONVILLE SE
2 INA SW
3 INA SE
4 SESSER NE (SHEET 3)
5 REND LAKE DAM NE (SHEET 5)
6 SESSER SE (SHEET 11)
7 REND LAKE DAM SW (SHEET 12)
8 REND LAKE DAM SE (SHEET 13)

INDEX TO ADJOINING 3.75 MAPS

REND LAKE DAM NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 4 OF 40

88°56'15" 88°52'30"

38°07'30" 38°07'30"

38°03'45" 38°03'45"

88°56'15" 88°52'30"

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

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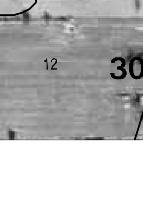
North American Datum of 1983 (NAD83), GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE
LOCATION

1	2	3
4		5
6	7	8

1 INA SW
2 INA SE
3 SPRING GARDEN SW
4 REND LAKE DAM NW (SHEET 4)
5 EWING NW (SHEET 6)
6 REND LAKE DAM SW (SHEET 12)
7 REND LAKE DAM SE (SHEET 13)
8 EWING SW (SHEET 14)

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REND LAKE DAM NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 5 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
EWING NW QUADRANGLE
SHEET NUMBER 6 OF 40

SCALE 1:12000

MILES
FEET
KILOMETERS

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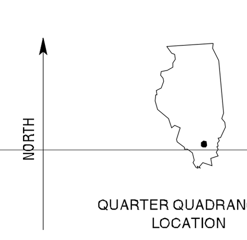
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 INA SE
2 SPRING GARDEN SW
3 SPRING GARDEN SE
4 REND LAKE DAM NE (SHEET 5)
5 EWING NE (SHEET 7)
6 REND LAKE DAM SE (SHEET 13)
7 EWING SW (SHEET 14)
8 EWING SE (SHEET 15)

INDEX TO ADJOINING 3.75 MAPS

EWING NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 6 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
EWING NE QUADRANGLE
SHEET NUMBER 7 OF 40

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

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North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 SPRING GARDEN SW
2 SPRING GARDEN SE
3 DAHLGREN SW
4 EWING NW (SHEET 6)
5 MACEDONIA NW (SHEET 8)
6 EWING SW (SHEET 14)
7 EWING SE (SHEET 15)
8 MACEDONIA SW (SHEET 16)

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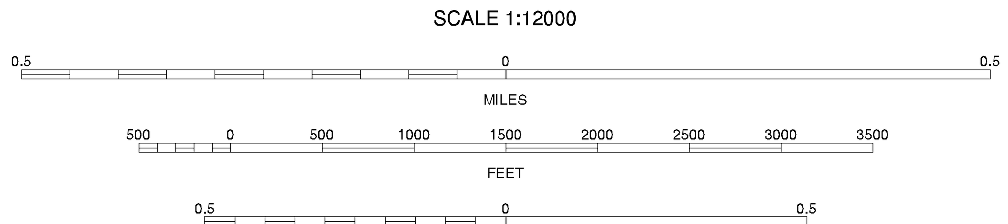
EWING NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 7 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
MACEDONIA NW QUADRANGLE
SHEET NUMBER 8 OF 40

SCALE 1:12000



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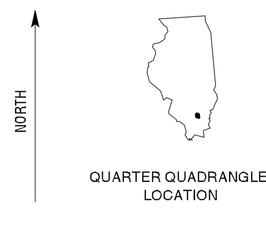
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 SPRING GARDEN SE
2 DAHLGREN SW
3 DAHLGREN SE
4 EWING NE (SHEET 7)
5 MACEDONIA NE
6 EWING SE (SHEET 15)
7 MACEDONIA SW (SHEET 16)
8 MACEDONIA SE

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MACEDONIA NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 8 OF 40

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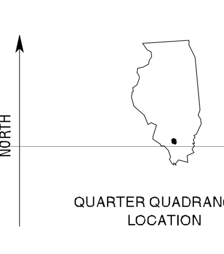
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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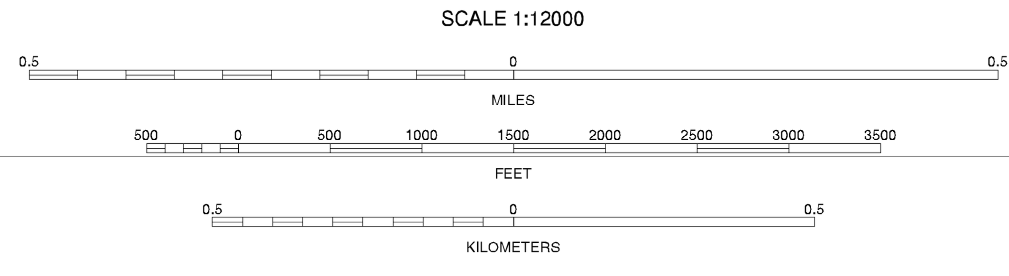

1	2	3
4		5
6	7	8

1 DU QUOIN NW
2 DU QUOIN NE (SHEET 1)
3 SESSER NW (SHEET 2)
4 DU QUOIN SW
5 SESSER SW (SHEET 10)
6 ELKVILLE NW
7 ELKVILLE NE (SHEET 17)
8 CHRISTOPHER NW (SHEET 18)

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DU QUOIN SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 9 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
SESSER SW QUADRANGLE
SHEET NUMBER 10 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 DU QUOIN NE (SHEET 1)
2 SESSER NW (SHEET 2)
3 SESSER NE (SHEET 3)
4 DU QUOIN SE (SHEET 9)
5 SESSER SE (SHEET 11)
6 ELKVILLE NE (SHEET 17)
7 CHRISTOPHER NW (SHEET 18)
8 CHRISTOPHER NE (SHEET 19)

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SESSER SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 10 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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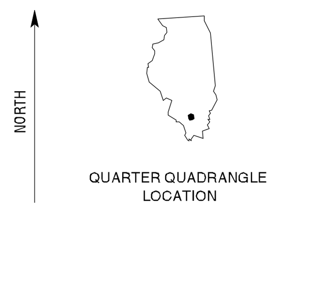
North American Datum of 1983 (NAD83). GRS-80 Spheroid 1000-meter ticks: Universal Transverse Mercator, zone 16. Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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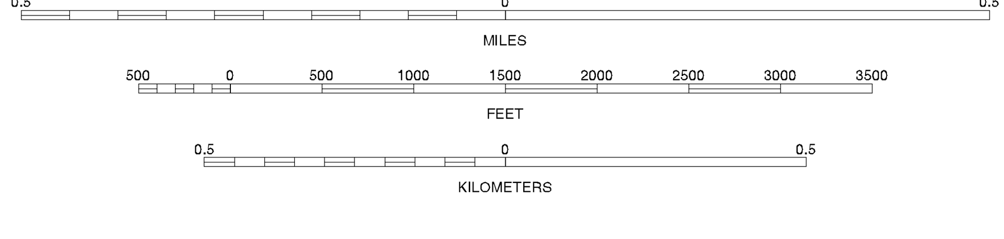

1	2	3
4		5
6	7	8

1 SESSER NW (SHEET 2)
2 SESSER NE (SHEET 3)
3 REND LAKE DAM NW (SHEET 4)
4 SESSER SW (SHEET 10)
5 REND LAKE DAM SW (SHEET 12)
6 CHRISTOPHER NW (SHEET 18)
7 CHRISTOPHER NE (SHEET 19)
8 WEST FRANKFORT NW (SHEET 20)

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SESSER SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 11 OF 40

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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 SESSER NE (SHEET 3)
2 REND LAKE DAM NW (SHEET 4)
3 REND LAKE DAM NE (SHEET 5)
4 SESSER SE (SHEET 11)
5 REND LAKE DAM SE (SHEET 13)
6 CHRISTOPHER NE (SHEET 19)
7 WEST FRANKFORT NW (SHEET 20)
8 WEST FRANKFORT NE (SHEET 21)

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REND LAKE DAM SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 12 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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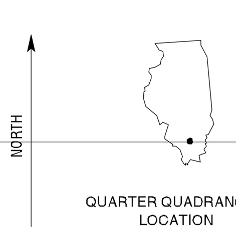
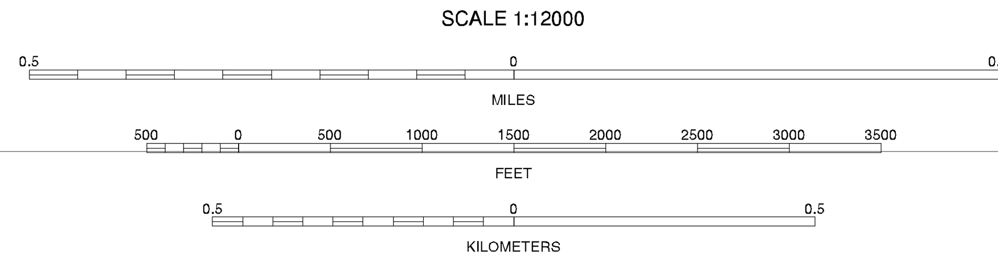
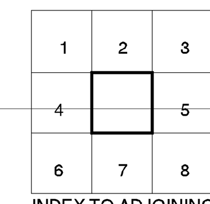
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.







1 REND LAKE DAM NW (SHEET 4)
2 REND LAKE DAM NE (SHEET 5)
3 EWING NW (SHEET 6)
4 REND LAKE DAM SW (SHEET 12)
5 EWING SW (SHEET 14)
6 WEST FRANKFORT NW (SHEET 20)
7 WEST FRANKFORT NE (SHEET 21)
8 THOMPSONVILLE NW (SHEET 22)

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REND LAKE DAM SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 13 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
EWING SW QUADRANGLE
SHEET NUMBER 14 OF 40

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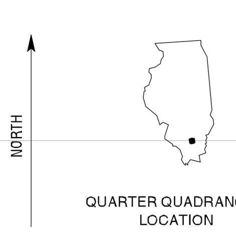
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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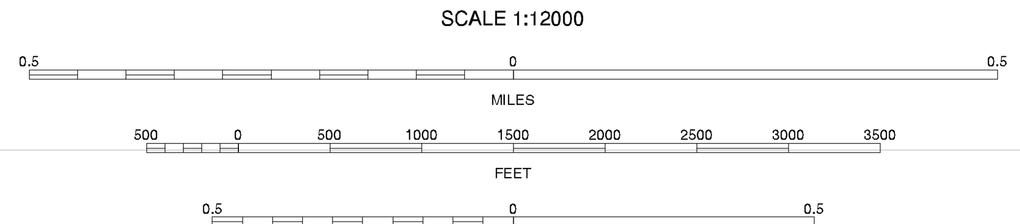

1	2	3
4		5
6	7	8

1 REND LAKE DAM NE (SHEET 5)
2 EWING NW (SHEET 6)
3 EWING NE (SHEET 7)
4 REND LAKE DAM SE (SHEET 13)
5 EWING SE (SHEET 15)
6 WEST FRANKFORT NE (SHEET 21)
7 THOMPSONVILLE NW (SHEET 22)
8 THOMPSONVILLE NE (SHEET 23)

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EWING SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 14 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
EWING SE QUADRANGLE
SHEET NUMBER 15 OF 40

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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

1	2	3
4		5
6	7	8

1 EWING NW (SHEET 6)
2 EWING NE (SHEET 7)
3 MACEDONIA NW (SHEET 8)
4 EWING SW (SHEET 14)
5 MACEDONIA SW (SHEET 16)
6 THOMPSONVILLE NW (SHEET 22)
7 THOMPSONVILLE NE (SHEET 23)
8 AKIN NW (SHEET 24)

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EWING SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 15 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
MACEDONIA SW QUADRANGLE
SHEET NUMBER 16 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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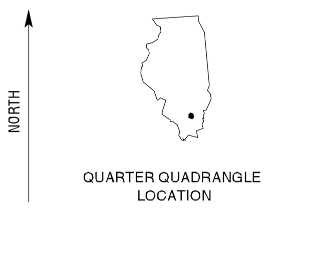
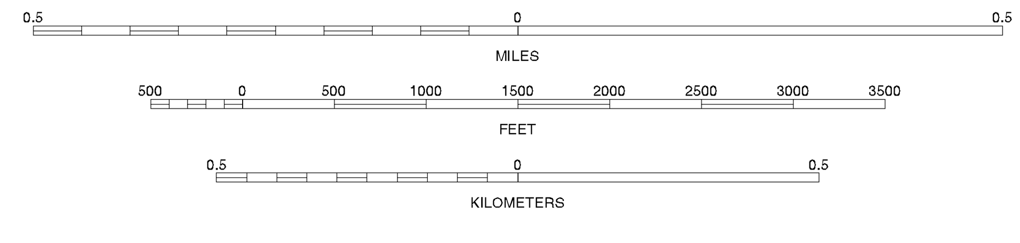
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 EWING NE (SHEET 7)
2 MACEDONIA NW (SHEET 8)
3 MACEDONIA NE
4 EWING SE (SHEET 15)
5 MACEDONIA SE
6 THOMPSONVILLE NE (SHEET 23)
7 AKIN NW (SHEET 24)
8 AKIN NE

INDEX TO ADJOINING 3.75 MAPS

MACEDONIA SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 16 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
ELKVILLE NE QUADRANGLE
SHEET NUMBER 17 OF 40

89°11′15″ 38°00′00″ — 89°07′30″ 38°00′00″

37°56′15″ 89°11′15″ — 37°56′15″ 89°07′30″

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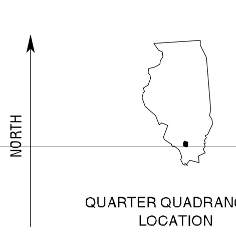
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 DU QUOIN SW
2 DU QUOIN SE (SHEET 9)
3 SESSER SW (SHEET 10)
4 ELKVILLE NW
5 CHRISTOPHER NW (SHEET 18)
6 ELKVILLE SW
7 ELKVILLE SE (SHEET 25)
8 CHRISTOPHER SW (SHEET 26)

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ELKVILLE NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 17 OF 40

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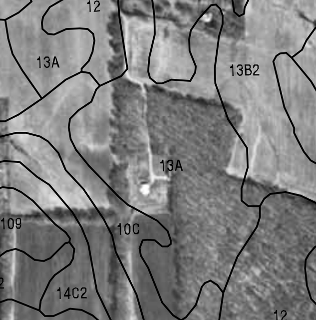
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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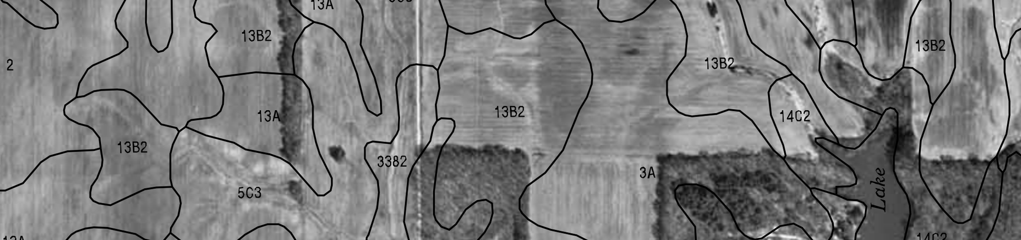


1	2	3
4		5
6	7	8

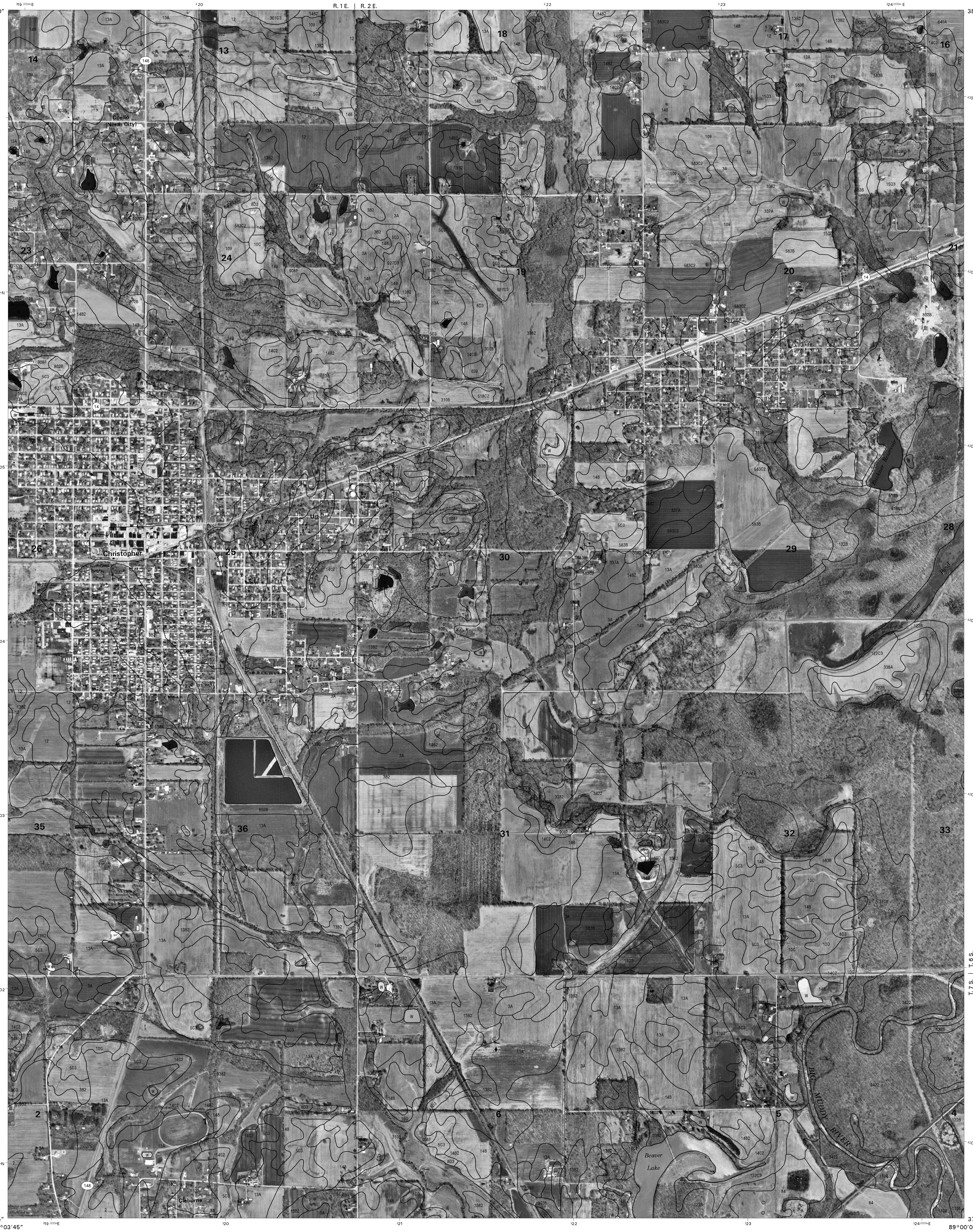
1 DU QUOIN SE (SHEET 9)
2 SESSER SW (SHEET 10)
3 SESSER SE (SHEET 11)
4 ELKVILLE NE (SHEET 17)
5 CHRISTOPHER NE (SHEET 19)
6 ELKVILLE SE (SHEET 25)
7 CHRISTOPHER SW (SHEET 26)
8 CHRISTOPHER SE (SHEET 27)

INDEX TO ADJOINING 3.75 MAPS

CHRISTOPHER NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 18 OF 40

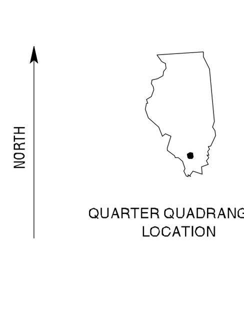
UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
CHRISTOPHER NE QUADRANGLE
SHEET NUMBER 19 OF 40

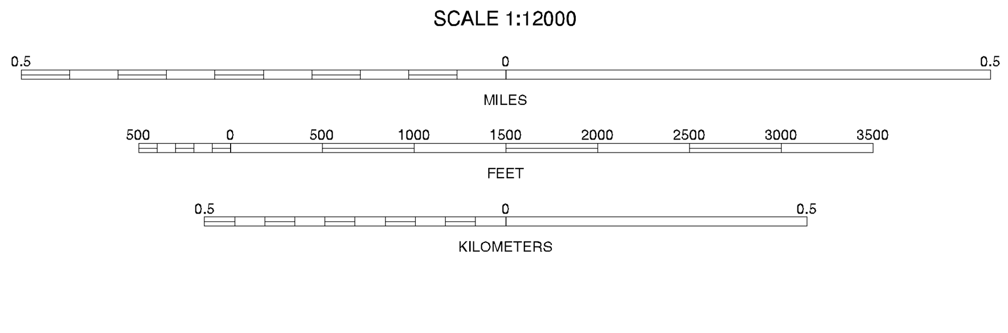


This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



SCALE 1:12000



1	2	3
4		5
6	7	8

1 SESSER SW (SHEET 10)
2 SESSER SE (SHEET 11)
3 REND LAKE DAM SW (SHEET 12)
4 CHRISTOPHER NW (SHEET 18)
5 WEST FRANKFORT NW (SHEET 20)
6 CHRISTOPHER SW (SHEET 26)
7 CHRISTOPHER SE (SHEET 27)
8 WEST FRANKFORT SW (SHEET 28)

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CHRISTOPHER NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 19 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
WEST FRANKFORT NW QUADRANGLE
SHEET NUMBER 20 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
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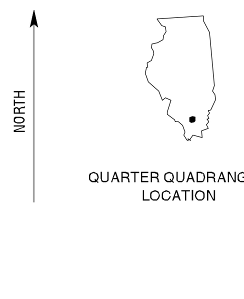
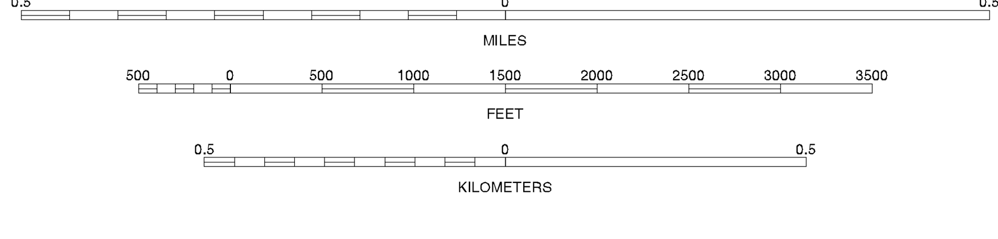
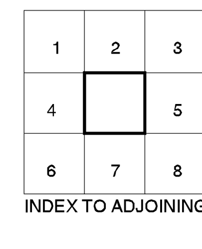


QUARTER QUADRANGLE LOCATION

SCALE 1:12000





1 SESSER SE (SHEET 11)
2 REND LAKE DAM SW (SHEET 12)
3 REND LAKE DAM SE (SHEET 13)
4 CHRISTOPHER NE (SHEET 19)
5 WEST FRANKFORT NE (SHEET 21)
6 CHRISTOPHER SE (SHEET 27)
7 WEST FRANKFORT SW (SHEET 28)
8 WEST FRANKFORT SE (SHEET 29)

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WEST FRANKFORT NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 20 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
WEST FRANKFORT NE QUADRANGLE
SHEET NUMBER 21 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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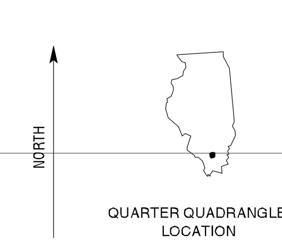
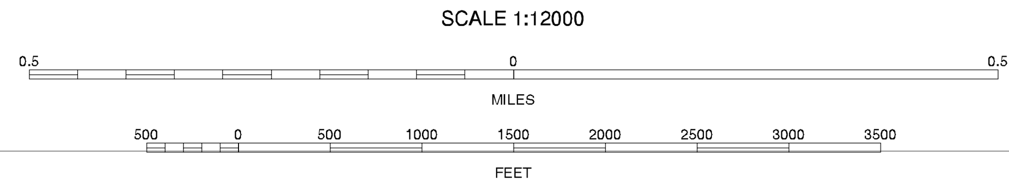
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 REND LAKE DAM SW (SHEET 12)
2 REND LAKE DAM SE (SHEET 13)
3 EWING SW (SHEET 14)
4 WEST FRANKFORT NW (SHEET 20)
5 THOMPSONVILLE NW (SHEET 22)
6 WEST FRANKFORT SW (SHEET 28)
7 WEST FRANKFORT SE (SHEET 29)
8 THOMPSONVILLE SW (SHEET 30)

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WEST FRANKFORT NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 21 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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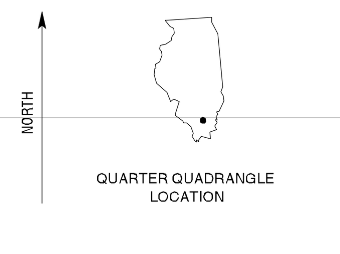
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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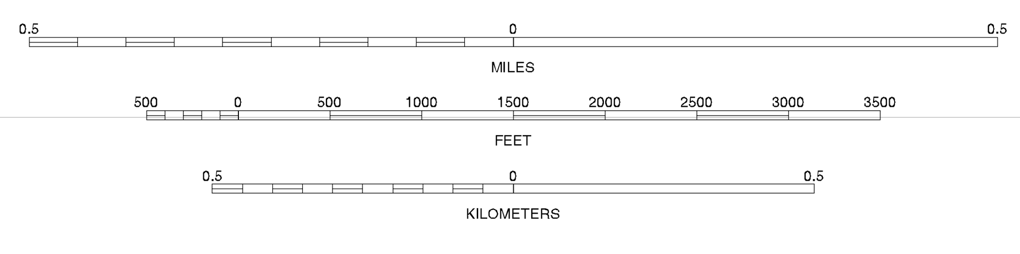

1	2	3
4		5
6	7	8

1 REND LAKE DAM SE (SHEET 13)
2 EWING SW (SHEET 14)
3 EWING SE (SHEET 15)
4 WEST FRANKFORT NE (SHEET 21)
5 THOMPSONVILLE NE (SHEET 23)
6 WEST FRANKFORT SE (SHEET 29)
7 THOMPSONVILLE SW (SHEET 30)
8 THOMPSONVILLE SE (SHEET 31)

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THOMPSONVILLE NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 22 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
THOMPSONVILLE NE QUADRANGLE
SHEET NUMBER 23 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

1	2	3
4		5
6	7	8

1 EWING SW (SHEET 14)
2 EWING SE (SHEET 15)
3 MACEDONIA SW (SHEET 16)
4 THOMPSONVILLE NW (SHEET 22)
5 AKIN NW (SHEET 24)
6 THOMPSONVILLE SW (SHEET 30)
7 THOMPSONVILLE SE (SHEET 31)
8 AKIN SW (SHEET 32)

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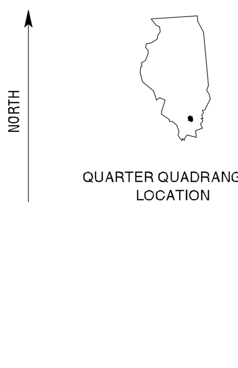
THOMPSONVILLE NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 23 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
AKIN NW QUADRANGLE
SHEET NUMBER 24 OF 40

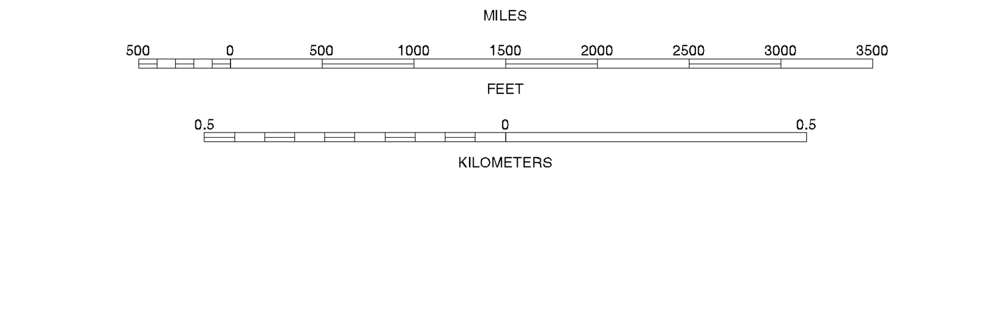
This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 EWING SE (SHEET 15)
2 MACEDONIA SW (SHEET 16)
3 MACEDONIA SE
4 THOMPSONVILLE NE (SHEET 23)
5 AKIN NE
6 THOMPSONVILLE SE (SHEET 31)
7 AKIN SW (SHEET 32)
8 AKIN SE

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AKIN NW, ILLINOIS
3.75 MINUTE SERIES
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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
ELKVILLE SE QUADRANGLE
SHEET NUMBER 25 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 ELKVILLE NW
2 ELKVILLE NE (SHEET 17)
3 CHRISTOPHER NW (SHEET 18)
4 ELKVILLE SW
5 CHRISTOPHER SW (SHEET 26)
6 DESOTO NW
7 DESOTO NE (SHEET 33)
8 HERRIN NW (SHEET 34)

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ELKVILLE SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 25 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
CHRISTOPHER SW QUADRANGLE
SHEET NUMBER 26 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

1 ELKVILLE NE (SHEET 17)
2 CHRISTOPHER NW (SHEET 18)
3 CHRISTOPHER NE (SHEET 19)
4 ELKVILLE SE (SHEET 25)
5 CHRISTOPHER SE (SHEET 27)
6 DESOTO NE (SHEET 33)
7 HERRIN NW (SHEET 34)
8 HERRIN NE (SHEET 35)

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CHRISTOPHER SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 26 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
CHRISTOPHER SE QUADRANGLE
SHEET NUMBER 27 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
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NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

1	2	3
4		5
6	7	8

1 CHRISTOPHER NW (SHEET 18)
2 CHRISTOPHER NE (SHEET 19)
3 WEST FRANKFORT NW (SHEET 20)
4 CHRISTOPHER SW (SHEET 26)
5 WEST FRANKFORT SW (SHEET 28)
6 HERRIN NW (SHEET 34)
7 HERRIN NE (SHEET 35)
8 JOHNSTON CITY NW (SHEET 36)

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CHRISTOPHER SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 27 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

89°00'00" 37°56'15"   R. 2 E.   88°56'15" 37°56'15"

37°52'30" 89°00'00"   37°52'30" 88°56'15"

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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES 0.5 0 0.5

FEET 500 0 500 1000 1500 2000 2500 3000 3500

KILOMETERS 0.5 0 0.5

1	2	3
4		5
6	7	8

1 CHRISTOPHER NE (SHEET 19)
2 WEST FRANKFORT NW (SHEET 20)
3 WEST FRANKFORT NE (SHEET 21)
4 CHRISTOPHER SE (SHEET 27)
5 WEST FRANKFORT SE (SHEET 29)
6 HERRIN NE (SHEET 35)
7 JOHNSTON CITY NW (SHEET 36)
8 JOHNSTON CITY NE (SHEET 37)

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WEST FRANKFORT SW, ILLINOIS

3.75 MINUTE SERIES
SHEET NUMBER 28 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
WEST FRANKFORT SE QUADRANGLE
SHEET NUMBER 29 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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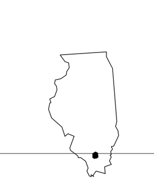
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES (0.5 – 0 – 0.5)

FEET (500 – 0 – 500 – 1000 – 1500 – 2000 – 2500 – 3000 – 3500)

KILOMETERS (0.5 – 0 – 0.5)

1	2	3
4		5
6	7	8

1 WEST FRANKFORT NW (SHEET 20)
2 WEST FRANKFORT NE (SHEET 21)
3 THOMPSONVILLE NW (SHEET 22)
4 WEST FRANKFORT SW (SHEET 28)
5 THOMPSONVILLE SW (SHEET 30)
6 JOHNSTON CITY NW (SHEET 36)
7 JOHNSTON CITY NE (SHEET 37)
8 PITTSBURG NW (SHEET 38)

INDEX TO ADJOINING 3.75 MAPS

WEST FRANKFORT SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 29 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
THOMPSONVILLE SW QUADRANGLE
SHEET NUMBER 30 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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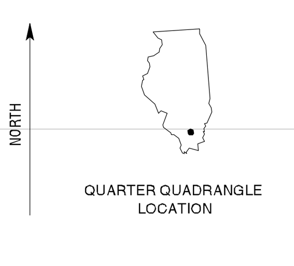
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



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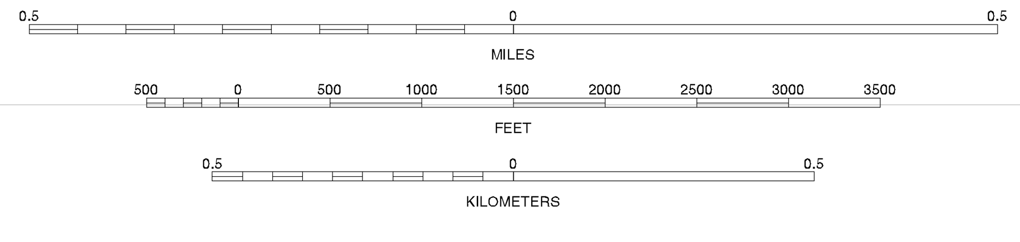

1	2	3
4		5
6	7	8

1 WEST FRANKFORT NE (SHEET 21)
2 THOMPSONVILLE NW (SHEET 22)
3 THOMPSONVILLE NE (SHEET 23)
4 WEST FRANKFORT SE (SHEET 29)
5 THOMPSONVILLE SE (SHEET 31)
6 JOHNSTON CITY NE (SHEET 37)
7 PITTSBURG NW (SHEET 38)
8 PITTSBURG NE (SHEET 39)

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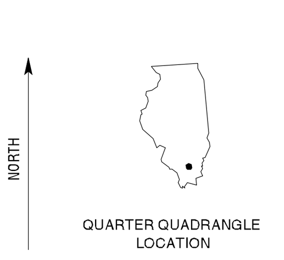
THOMPSONVILLE SW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 30 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
THOMPSONVILLE SE QUADRANGLE
SHEET NUMBER 31 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 THOMPSONVILLE NW (SHEET 22)
2 THOMPSONVILLE NE (SHEET 23)
3 AKIN NW (SHEET 24)
4 THOMPSONVILLE SW (SHEET 30)
5 AKIN SW (SHEET 32)
6 PITTSBURG NW (SHEET 38)
7 PITTSBURG NE (SHEET 39)
8 HARCO NW (SHEET 40)

INDEX TO ADJOINING 3.75 MAPS

THOMPSONVILLE SE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 31 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

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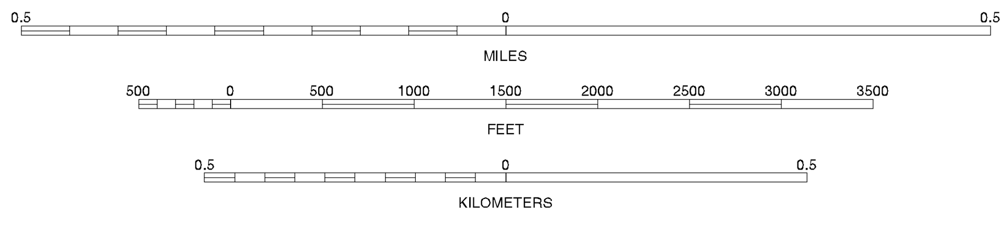
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

SCALE 1:12000



1	2	3
4		5
6	7	8

1 THOMPSONVILLE NE (SHEET 23)
2 AKIN NW (SHEET 24)
3 AKIN NE
4 THOMPSONVILLE SE (SHEET 31)
5 AKIN SE
6 PITTSBURG NE (SHEET 39)
7 HARCO NW (SHEET 40)
8 HARCO NE

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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

1	2	3	
4		5	
6	7	8	

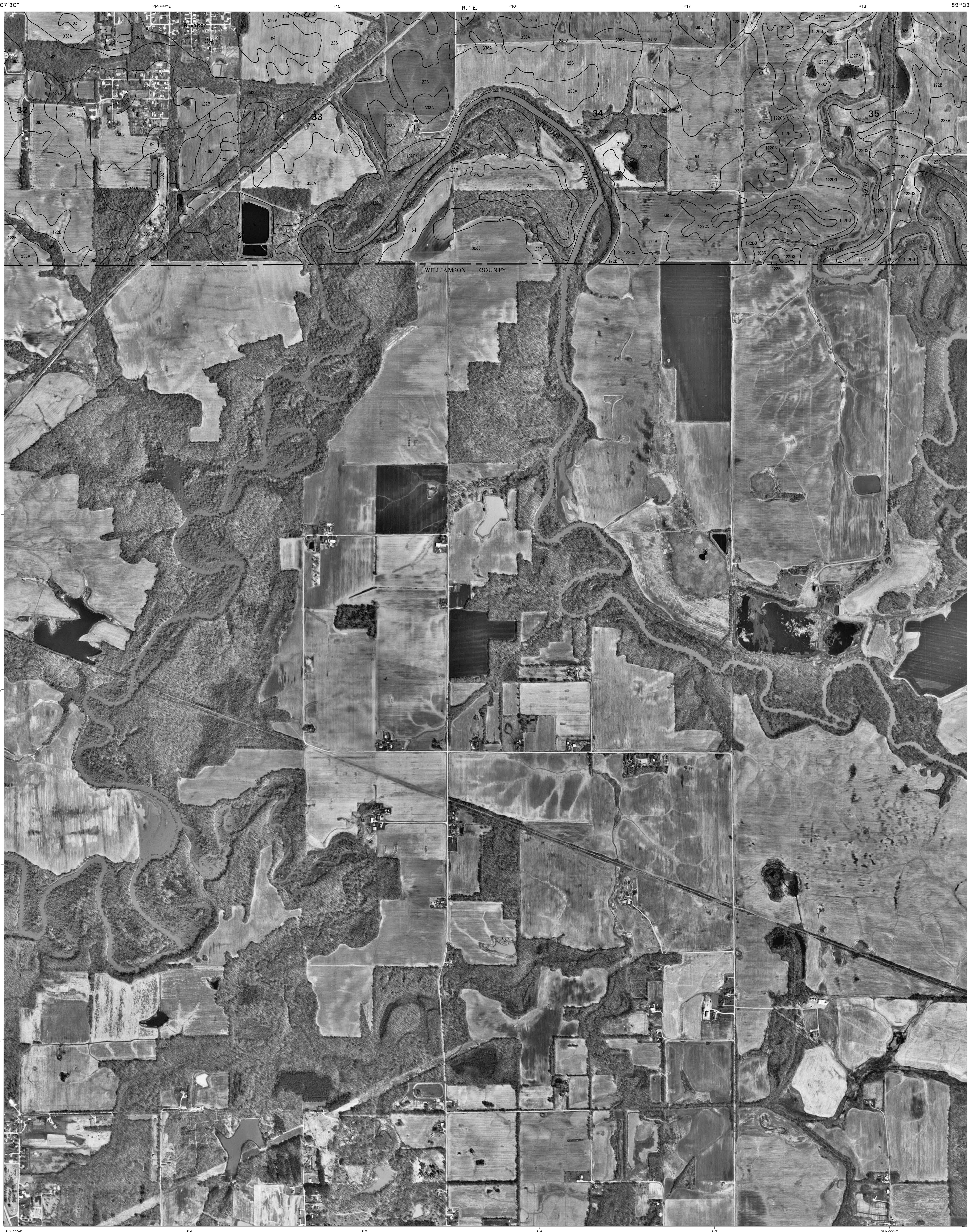
1 ELKVILLE SW
2 ELKVILLE SE (SHEET 25)
3 CHRISTOPHER SW (SHEET 26)
4 DESOTO NW
5 HERRIN NW (SHEET 34)
6 DESOTO SW
7 DESOTO SE
8 HERRIN SW

INDEX TO ADJOINING 3.75 MAPS

DESOTO NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 33 OF 40

89°07'30"
37°52'30"

89°03'45"
37°52'30"



37°48'45"
89°07'30"

37°48'45"
89°03'45"

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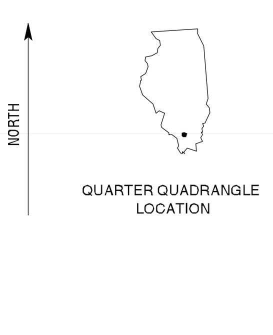
North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5
MILES

500 0 500 1000 1500 2000 2500 3000 3500
FEET

0.5 0 0.5
KILOMETERS

1	2	3
4		5
6	7	8

1 ELKVILLE SE (SHEET 25)
2 CHRISTOPHER SW (SHEET 26)
3 CHRISTOPHER SE (SHEET 27)
4 DESOTO NE (SHEET 33)
5 HERRIN NE (SHEET 35)
6 DESOTO SE
7 HERRIN SW
8 HERRIN SE

INDEX TO ADJOINING 3.75 MAPS

HERRIN NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 34 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
HERRIN NE QUADRANGLE
SHEET NUMBER 35 OF 40

This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
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North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

1	2	3
4		5
6	7	8

1 CHRISTOPHER SW (SHEET 26)
2 CHRISTOPHER SE (SHEET 27)
3 WEST FRANKFORT SW (SHEET 28)
4 HERRIN NW (SHEET 34)
5 JOHNSTON CITY NW (SHEET 36)
6 HERRIN SW
7 HERRIN SE
8 JOHNSTON CITY SW

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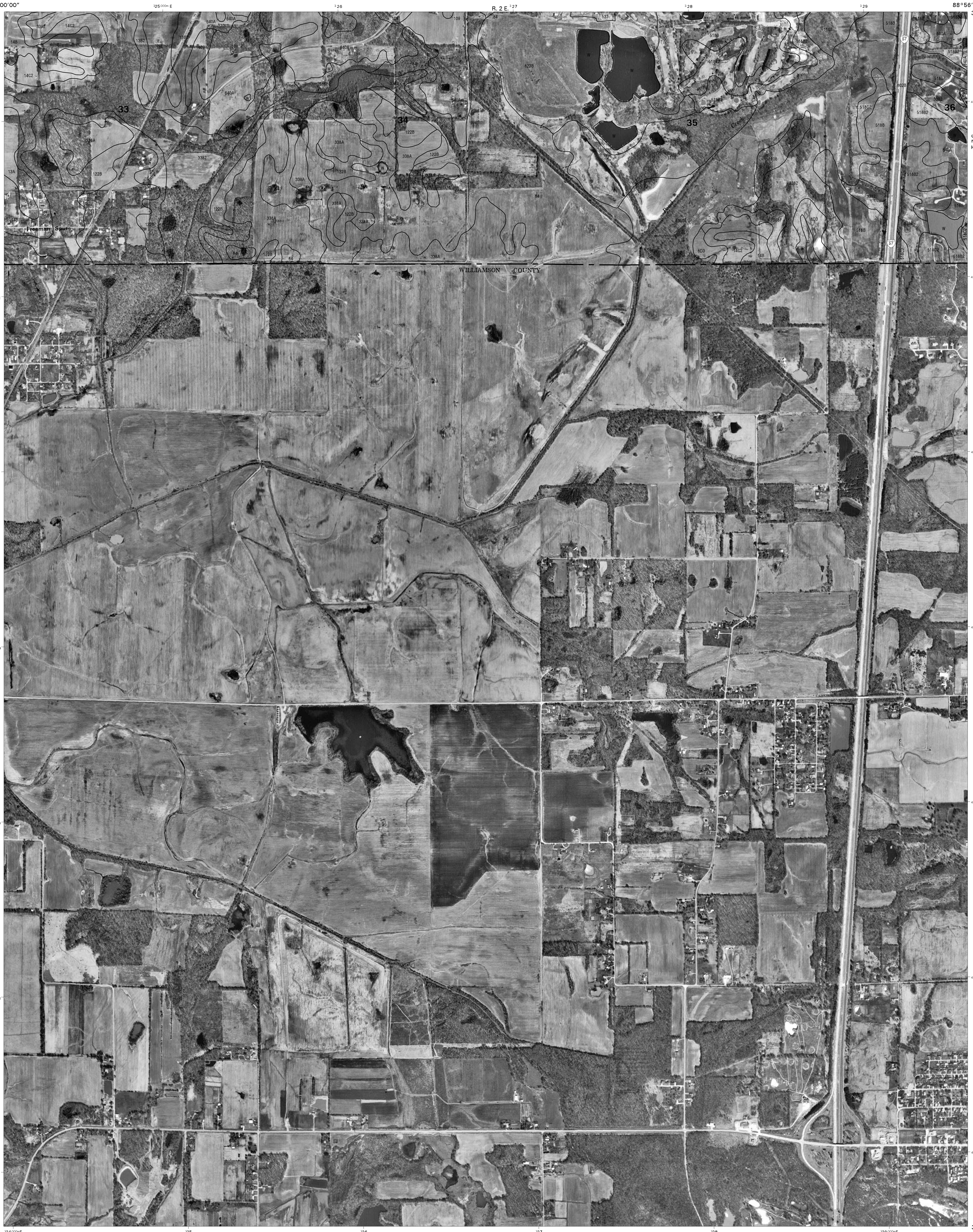
HERRIN NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 35 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
JOHNSTON CITY NW QUADRANGLE
SHEET NUMBER 36 OF 40



This soil survey was compiled by the U.S. Department of Agriculture, Natural Resources Conservation Service and cooperating agencies.
Base maps are orthophotographs prepared by the U.S. Department of Interior, Geological Survey, from 1993 aerial photography.

North American Datum of 1983 (NAD83). GRS-80 Spheroid
1000-meter ticks: Universal Transverse Mercator, zone 16.
Coordinate grid ticks and land division data, if shown, are approximately positioned. Digital data are available for this quadrangle.

NORTH

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 0 0.5 MILES

500 0 500 1000 1500 2000 2500 3000 3500 FEET

0.5 0 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 CHRISTOPHER SE (SHEET 27)
2 WEST FRANKFORT SW (SHEET 28)
3 WEST FRANKFORT SE (SHEET 29)
4 HERRIN NE (SHEET 35)
5 JOHNSTON CITY NE (SHEET 37)
6 HERRIN SE
7 JOHNSTON CITY SW
8 JOHNSTON CITY SE

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JOHNSTON CITY NW, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 36 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
JOHNSTON CITY NE QUADRANGLE
SHEET NUMBER 37 OF 40

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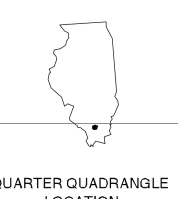
NORTH



QUARTER QUADRANGLE LOCATION

SCALE 1:12000

0.5 — 0 — 0.5 MILES

500 — 0 — 500 — 1000 — 1500 — 2000 — 2500 — 3000 — 3500 FEET

0.5 — 0 — 0.5 KILOMETERS

1	2	3
4		5
6	7	8

1 WEST FRANKFORT SW (SHEET 28)
2 WEST FRANKFORT SE (SHEET 29)
3 THOMPSONVILLE SW (SHEET 30)
4 JOHNSTON CITY NW (SHEET 36)
5 PITTSBURG NW (SHEET 38)
6 JOHNSTON CITY SW
7 JOHNSTON CITY SE
8 PITTSBURG SW

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SHEET NUMBER 37 OF 40

UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
PITTSBURG NW QUADRANGLE
SHEET NUMBER 38 OF 40

88°52'30" 37°52'30"

R. 3 E. | R. 4 E. 88°48'45" 37°52'30"

37°48'45" 88°52'30"

37°48'45" 88°48'45"

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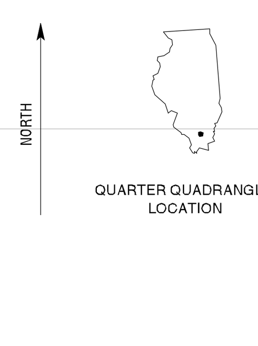
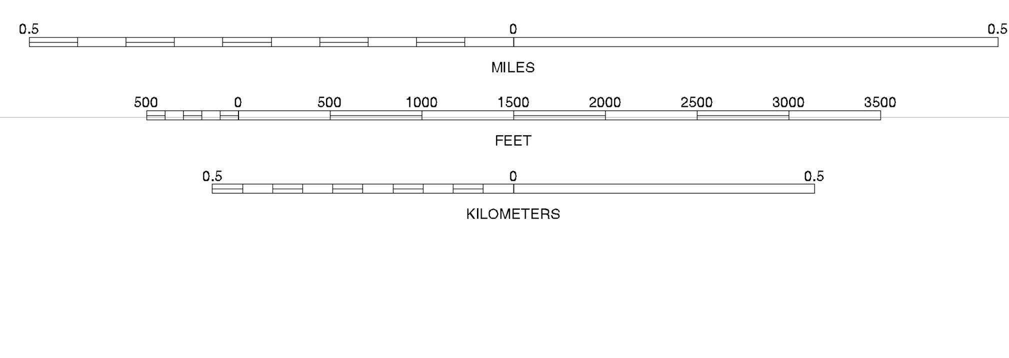


QUARTER QUADRANGLE LOCATION

SCALE 1:12000



1	2	3
4		5
6	7	8

1 WEST FRANKFORT SE (SHEET 29)
2 THOMPSONVILLE SW (SHEET 30)
3 THOMPSONVILLE SE (SHEET 31)
4 JOHNSTON CITY NE (SHEET 37)
5 PITTSBURG NE (SHEET 39)
6 JOHNSTON CITY SE
7 PITTSBURG SW
8 PITTSBURG SE

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3.75 MINUTE SERIES
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UNITED STATES
DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

FRANKLIN COUNTY, ILLINOIS
PITTSBURG NE QUADRANGLE
SHEET NUMBER 39 OF 40

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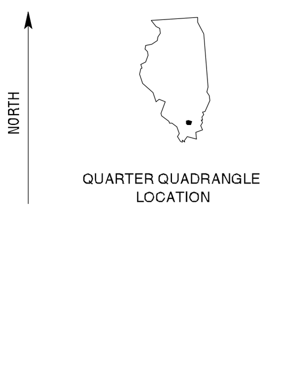

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES: 0.5 — 0 — 0.5

FEET: 500 — 0 — 500 — 1000 — 1500 — 2000 — 2500 — 3000 — 3500

KILOMETERS: 0.5 — 0 — 0.5

1	2	3
4		5
6	7	8

1 THOMPSONVILLE SW (SHEET 30)
2 THOMPSONVILLE SE (SHEET 31)
3 AKIN SW (SHEET 32)
4 PITTSBURG NW (SHEET 38)
5 HARCO NW (SHEET 40)
6 PITTSBURG SW
7 PITTSBURG SE
8 HARCO SW

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PITTSBURG NE, ILLINOIS
3.75 MINUTE SERIES
SHEET NUMBER 39 OF 40

UNITED STATES
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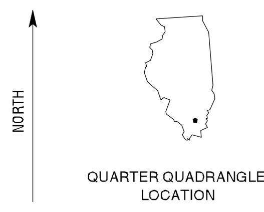

QUARTER QUADRANGLE LOCATION

SCALE 1:12000

MILES

FEET

KILOMETERS

1 THOMPSONVILLE SE (SHEET 31)
2 AKIN SW (SHEET 32)
3 AKIN SE
4 PITTSBURG NE (SHEET 39)
5 HARCO NE
6 PITTSBURG SE
7 HARCO SW
8 HARCO SE

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